Cy 1

STRESS WAVES IN COMPOSITE LAMINATES

Ray Kinslow

ARO, Inc.

June 1965

VON KÁRMÁN GAS DYNAMICS FACILITY

ARNOLD ENGINEERING DEVELOPMENT CENTER

AIR FORCE SYSTEMS COMMAND

ARNOLD AIR FORCE STATION, TENNESSEE

Cy 1

NOTICES

STRESS WAVES IN COMPOSITE LAMINATES

Ray Kinslow*

ARO, Inc.

---

*Chairman, Department of Engineering Science, Tennessee Technological University, Cookeville, Tennessee, and Consultant, ARO, Inc.

FOREWORD

This report has been reviewed and is approved.

Darreld K. Calkins　　　　　　　　　　　Jean A. Jack
Major, USAF　　　　　　　　　　　　　　Colonel, USAF
AF Representative, VKF　　　　　　　　　DCS/Test
DCS/Test

ABSTRACT

Fractures caused by stress waves resulting from hypervelocity impact are sometimes reduced, and at other times are increased, by the use of laminated materials. An analysis of some of the parameters which affect the ability of a laminated structure to resist fracture following impact has been conducted. It is shown that there are multiple reflections from the interfaces bounding any layer of material. The amplitudes of these waves attenuate very rapidly, but because their transmitted components may combine in phase with other waves, they sometimes contribute substantially to the total stress produced. It is shown that these combined waves may result in a stress much greater in the laminated material than would have been produced by the same impact on a solid target of either of the materials used; however, under other conditions, the laminate may be employed to reduce the stress to a very small value. Pressure pulse amplitudes in materials having impedance mismatch values ranging from 0.1 to 10.0 and having as many as thirty laminations are presented in both graphical and tabular form.

CONTENTS

ILLUSTRATIONS

NOMENCLATURE

A, B, C,	Amplitudes of reflected waves
AA, BB, CC,	Transmitted components of A, B, C,
B', B''	Amplitudes of secondary waves
c	Velocity of elastic waves
E	Young's modulus
e	Base of natural logarithms
K	Impedance mismatch
N	Lamination or interface number
P	Amplitude of primary pressure wave
T	Time
t	Lamination thickness
V	Particle velocity
ν	Poisson's ratio
ρ	Material density
λ	Wave or pulse length

SUBSCRIPTS

A	Aluminum
N	Lamination or interface number
o	Original wave or pulse
r	Reflected component
t	Transmitted component
W	Water

SECTION I
INTRODUCTION

It has been demonstrated that fractures caused by stress waves induced by hypervelocity impact can, in many cases, be reduced by employing laminated targets (Ref. 1). Figure 1 shows a fracture near the rear surface of a solid copper target caused by reflected stress waves. Figure 2 shows the absence of such fractures in a copper-solder laminated target of lesser thickness subjected to a slightly more severe impact. Solid copper targets one-inch thick have spalled near the rear surface when impacted by 3/16-in.-diam aluminum projectiles having velocities as low as 17,500 ft/sec, whereas laminated targets (Fig. 2) 0.75-in. thick have failed to spall when impacted with identical projectiles having velocities of 21,300 ft/sec.

The results of such experimental work have served to alert the design engineer to the possibility of reducing the probability of damage by the use of laminates. It is realized, however, that it is impossible to test all, or even a small percentage of the possible laminates (Ref. 2).

It is just as important that the design engineer realize that the use of laminates does not necessarily reduce the probability of damage but may in some cases result in an increase in damage to the structure. For example, a 30-cal by 0.15-in. Lexan[®] (a polycarbonate resin) projectile fired at a velocity of 21,100 fps destroyed a 2.25-in.-thick laminated plastic target, but an identical projectile fired at 21,800 fps into a 2.0-in.-thick solid target of the same plastic left the target intact (Ref. 3). It has been shown that an aluminum-copper laminate may sustain greater damage than a solid target of aluminum, but that an aluminum-polyethylene laminate would realize less damage (Ref. 4) when impacted at the same velocity by an identical projectile.

This report deals primarily with a theoretical study of the transmission and reflection of stress waves in composite laminates and an analysis of some of the parameters which may affect the ability of a structure to resist fracture induced by hypervelocity impact. It is hoped that this study will answer some of the questions as to how and why laminates act as they do when subjected to impact.

SECTION II
ASSUMPTIONS AND LIMITATIONS

As in most theoretical investigations, it is necessary to make certain assumptions and to specify some limitations. This may be done

either to simplify the mathematical derivations or because of a lack of information or knowledge in certain areas. Both of these reasons have prompted the following assumptions:

1. This report is limited to the action of elastic waves in the targets. When a solid body is impacted by a hypervelocity projectile, a crater is formed which expands very rapidly at first. As the velocity of crater formation decreases, a shock wave is detached from its surface but soon decays into a spherical elastic wave which continues to travel through the target (Ref. 5). The relative distance covered by the plastic shock wave is small, assuming a thick target, and fractures produced within this distance consist mainly of deformation of the target and ejection of target material by forces other than those attributed to the shock wave.

2. Closely related to the above is the assumption that the velocity of the elastic wave is a constant through any given material and is specified by the relation

$$c = \left[\frac{E(1-\nu)}{\rho(1+\nu)(1-2\nu)} \right]^{\frac{1}{2}} \tag{1}$$

where c is the wave velocity, E is Young's modulus, ν is Poisson's ratio, and ρ is the material density. This assumption is made for both incident and reflected waves. Since the reflected wave will traverse material through which the incident wave has recently passed, it is acknowledged that the density and elastic constants may change slightly, perhaps because of the heating of the material. (It has been shown that the velocity of the reflected wave in Lucite[®] (acrylic resin) is about 80 percent of that of the incident wave (Ref. 3)). The reason for the assumption of constant velocity of the elastic wave is that, at present, the changes in material properties and temperatures are not known for the various materials.

3. Proceeding from the above, it is further assumed that the value of the product, ρc, called the "characteristic impedance" of the medium, remains constant.

4. The primary purpose of this study is to compare the stresses produced in laminates with the stresses produced in targets of a homogeneous material. This comparison can be made by neglecting the stress attenuation attributed to distance. Except as noted, this attenuation is neglected in this report. When the attenuation of the stress is not neglected, it is assumed that the rate of attenuation of stress amplitude at the wave front as a function of the distance from its origin is the same

in both homogeneous and laminated material, the amplitude of the spherical pulse being inversely proportional to the distance (Ref. 6).

5. Only the stresses along the axis perpendicular to the lamination interfaces will be considered. Unless the lateral dimensions of the target are very small, the maximum stress will be produced on this axis.

6. Energy losses are neglected.

SECTION III
PULSE BEHAVIOR AT AN INTERFACE

An abrupt change in the physical properties of a material will result in the modification of a pressure pulse as it encounters this change. In general, a portion of the pulse will be transmitted, and a portion will be reflected.

The relations which describe the modification of a pulse are based upon the boundary conditions of continuity of pressure and continuity of particle velocity across the interface.

The equations which express these conditions may be written as

$$P_o + P_r = P_t \qquad (2)$$

and

$$V_o - V_r = V_t \qquad (3)$$

where P is pressure, V is particle velocity, and o, r, and t refer to the original pulse, the reflected pulse, and the transmitted pulse, respectively. The expression for the conservation of momentum at the pulse front is (Ref. 7)

$$P = \rho c V \qquad (4)$$

Substituting the value of V from this relation into Eq. (3) gives

$$\frac{P_o}{\rho_o c_o} - \frac{P_r}{\rho_r c_r} = \frac{P_t}{\rho_t c_t} \qquad (5)$$

Making use of the relation

$$\rho_o c_o = \rho_r c_r \quad \text{(Assumption 3)} \qquad (6)$$

gives

$$\frac{P_o - P_r}{\rho_o c_o} = \frac{P_t}{\rho_t c_t} \qquad (7)$$

Solving Eqs. (2) and (7) simultaneously gives the following important relations:

$$P_t = \left[\frac{2\rho_t c_t}{\rho_t c_t + \rho_0 c_0} \right] P_0 \tag{8}$$

$$P_r = \left[\frac{\rho_t c_t - \rho_0 c_0}{\rho_t c_t + \rho_0 c_0} \right] P_0 \tag{9}$$

These may be referred to as the "impedance mismatch" equations. Dividing Eq. (8) by Eq. (9) gives

$$\frac{P_t}{P_r} = \frac{2\rho_t c_t}{\rho_t c_t - \rho_0 c_0} \tag{10}$$

These equations are somewhat simplified by letting

$$K = \frac{\rho_t c_t}{\rho_0 c_0} \tag{11}$$

giving

$$P_t = \left[\frac{2K}{K+1} \right] P_0 \tag{12}$$

$$P_r = \left[\frac{K-1}{K+1} \right] P_0 \tag{13}$$

and

$$\frac{P_t}{P_r} = \frac{2K}{K-1} \tag{14}$$

Some conclusions which may be drawn from these relations are:

1. The sign of P_t will always be the same as P_0. That is, a compression wave will always be transmitted as a compression wave, and a release or tensile wave will always be transmitted as a tensile wave.

2. The sign of P_r may be the same as that of P_0 or it may be different. If $K < 1$ a compression wave will be reflected as tensile wave, and a tensile wave will be reflected as a compression wave. If $K > 1$ the sign of the reflected wave will be the same as that of the incident wave.

3. If $K \cong 1$, $P_t \cong P_0$ and $P_r \equiv 0$

4. When $K \ll 1$, $P_t \cong 0$ and $P_r \equiv -P_0$

5. When $K \gg 1$, $P_t \cong 2P_0$ and $P_r \cong P_0$

Reference to Fig. 3 may aid in understanding the mechanics of the pulse at the interface. At the top of the figure are shown two distance-time plots of a step-function pulse having a length λ and an amplitude P_0. The one shown at the left is moving toward a region having a lower characteristic impedance than the first, $K < 1$, and at the right the pulse is

shown moving into a material of higher impedance, $K > 1$. Shown below the x-t plots are profiles of the pulse as it is transmitted and reflected at the interfaces. For the conditions of $K < 1$ assume that $K = 0.5$. The transmitted pulse will have an amplitude of $+0.667\ P_O$, and the reflected component will have an amplitude of $-0.333\ P_O$. Until complete transmission and reflection have occurred (which requires a time of λ / c_O), the reflected and incident pulses will interact as shown. In the case of $K > 1$, assume $K = 2.0$. The amplitudes of the transmitted and reflected pulses will be $1.333\ P_O$ and $0.333\ P_O$, respectively.

Stresses developed will depend not only upon the amplitude of the incident pulse, P_O, and upon the properties of the materials, but also upon the profile of the pressure pulse. No attempt will be made to describe these profiles, but references will be made to their effects. Profiles of simple geometric forms will be used as illustrations.

Figure 4 gives the values of the transmitted and reflected pulse amplitudes as functions of K. In order that these values may be determined for various combinations of actual materials, Table I gives some average handbook values of density, wave velocity, and characteristic impedance of some common materials, and Table II gives impedance mismatch values of some possible material combinations.

The effect of the impedance mismatch, K, on the amplitude of the reflected pulse is shown qualitatively in Fig. 5. Identical shock waves were produced in the two Lucite blocks by explosives placed on one face of each block. The first was surrounded by air when the explosion occurred. As $K \cong 0$ from Lucite to air, the amplitude of the reflected pulse, $P_r \equiv -P_O$. The spall near the rear surface was therefore produced by the reflection of the pressure pulse as a tensile wave. The explosion occurred on the face of the second block while it was floating on mercury. The value of K from Lucite to mercury is approximately six. The pulse in this case was reflected as a pressure wave having a value of about $0.72\ P_O$. Since no tensile stresses were produced, the material did not fracture.

Although the relations for the amplitude of transmitted and reflected waves were derived only for normal incidence of pressure waves, the fractures in the Lucite cylinders shown in Fig. 6 further illustrate the point. These cylinders were surrounded by air, water, and mercury, respectively, when subjected to identical explosive forces at their bases.

SECTION IV
MULTIPLE LAMINATIONS

A laminated structure is made up of N interfaces joining N + 1 layers of material. The first layer of material in which the magnitude of the pressure pulse is P_O is designated as N = 0. The structure may consist of any number of materials, but for the present it will be assumed that only two different materials are employed, because this is the most common type of laminate and is the only one for which it is practical to develop general relations. If more than two materials are used, it is usually more simple to compute the stress magnitudes layer by layer than to depend upon derived equations.

Consider the case in which the laminations N = 0, 2, 4, 6 - - - have a characteristic impedance of $\rho_O c_O$, and the alternate layers N = 1, 3, 5, 7, - - - have an impedance of ρc. The amplitude of the pulse transmitted past the first interface has the value, according to Eq. (12), of

$$P_t \Big]_{N=1} = \left[\frac{2K}{K+1} \right] P_0$$

and the pressure reflected from this interface is (Eq. (13))

$$P_r \Big]_{N=1} = \left[\frac{K-1}{K+1} \right] P_0$$

if the value of K = $\rho c / \rho_O c_O$. As the transmitted pulse reaches the second interface, a portion of it will be transmitted, and a part of it will be reflected. However, the value of the impedance mismatch at this interface is not K but has a value of 1/K. The amplitude of the pulse transmitted across the second interface is, therefore,

$$P_t \Big]_{N=2} = \left[\frac{2}{K+1} \right] \left[\frac{2K}{K+1} \right] P_0 = \frac{4K}{(K+1)^2} P_0$$

and the amplitude of the reflected component is

$$P_r \Big]_{N=2} = \left[\frac{1-K}{1+K} \right] \left[\frac{2K}{K+1} \right] P_0 = \frac{2K(1-K)}{(K+1)^2} P_0$$

This process can be repeated again and again in order to determine the pulse amplitude at any point in the structure. The following relations, however, will eliminate much labor and will permit these values to be computed directly for any point in the structure.

The magnitude of the pulse transmitted past the Nth interface is given by the relation

$$P_t\big]_N = \left[\frac{2}{1+K}\right]^N K^{\frac{N}{2}} P_o \qquad (15)$$

if N is an even number and

$$P_t\big]_N = \left[\frac{2}{1+K}\right]^N K^{\frac{N+1}{2}} P_o \qquad (16)$$

if N is an odd number.

Plots of these values of pulse amplitudes in materials having impedance mismatch ranging from 0.1 to 10.0 and for thirty laminations (numbered zero through 29) are shown in Fig. 7. These will be referred to as primary pulses. A comparison of the effect of K on the pulse amplitude can be made by reference to Fig. 8.

The pulse reflected from the Nth interface has an amplitude of

$$P_r\big]_N = \left[\frac{1-K}{2}\right]\left[\frac{2}{1+K}\right]^N K^{\frac{N}{2}} P_o \qquad (17)$$

for even values of N, and

$$P_r\big]_N = \left[\frac{K-1}{2}\right]\left[\frac{2}{1+K}\right]^N K^{\frac{N-1}{2}} P_o \qquad (18)$$

for odd values of N.

There will be multiple reflections from the two interfaces bounding any layer of material. Figure 9 shows these reflections as A, B, C, - - -. A fraction of each reflected pulse will be transmitted through the bounding interfaces, and these are indicated as AA, BB, CC, - - -. The notations given in this figure replace the notations $P_t\big]_N$ by simply P_N and replace $P_r\big]_{N+1}$ by A_N. The values of these multiple reflected pulses are given by the following equations:

$$A_N = \pm\left(\frac{1-K}{1+K}\right) P_N \qquad (19)$$

$$B_N = \left(\frac{1-K}{1+K}\right)^2 P_N \qquad (20)$$

$$E_N = \pm\left(\frac{1-K}{1+K}\right)^5 P_N \qquad (21)$$

The signs of the forward moving pulses (B, D, F, - - -) will always be plus (+), and those of the backward moving ones (A, C, E, - - -) will depend upon whether the bounding laminations have higher or lower impedance. If $K < 1$, the sign will be + if N is odd and minus (-) if N is even. If $K > 1$, the sign will be + if N is even and - if odd. The amplitude of the transmitted components, AA, BB, CC, . . . will be $2K/(K+1)$ or $2/(K+1)$ times the corresponding amplitudes of A, B, C, . . ., depending upon whether the transmission is into a material of higher or lower impedance.

These equations are very cumbersome to use. However, the values can be of importance to the design engineer, and therefore, values of P, A, B, C, D, E, AA, BB, CC, and DD have been computed for all values of N from 1 to 30 and for impedance mismatch values from 0.1 to 10.0. These are included in the Appendix. The value of P_O has been taken as unity; therefore, all values given in the Appendix must be multiplied by P_O.

The backward moving pulses AA, CC, EE, - - -, form a rapidly converging series, the sum of which can be shown to be equal to the value of $-A_{N-1}$. Therefore, the sum

$$A_{N-1} + AA_N + CC_N + \cdots \cdots = 0$$

The forward moving pulses from the Nth lamination (P_{N+1}, BB_N, DD_N, ---) also constitute a rapidly converging series with the sum of the series

$$P_{N+1} + BB_N + DD_N + \cdots \cdots = P_{N-1}$$

This states that the sum of the amplitudes of the leading edges of all the pressure pulses transmitted at the second interface of any lamination is equal to the amplitude of the pulse impinging upon the first interface. This is to be expected because pulse attenuation and energy losses have been neglected.

The occurrence of these multiple reflections within a layer of material is illustrated by the following example. An aluminum plate having a thickness of 0.25-in. formed one side of a tank containing water. A small blasting cap was exploded in contact with the outside surface of the plate producing a pressure pulse in the aluminum having an amplitude of P_O. The explosive was of sufficiently small magnitude as not to produce a crater of any significant size. The impedance mismatch between aluminum and water is approximately 0.1 and that between aluminum and air is practically zero. According to Eqs. (12) and (13), the amplitude of the pulse transmitted into the water was $0.182 P_O$ and that of the pulse reflected from the aluminum-water interface was a negative or release wave having an amplitude of $-0.818 P_O$. At the aluminum-air interface,

reflection is nearly total. This reflected pulse, upon reaching the aluminum-water interface, will again be partially transmitted and partially reflected. Figure 10 is a distance-time plot showing the wave fronts in the aluminum and in the water. Figure 11 is a photograph showing clearly these multiple waves in the water produced by the internal reflections in the aluminum plate. Considering the fact that the exact pulse velocity for this aluminum alloy is not known, there is very good agreement between the theoretical plot and the photograph of the waves in the water. According to the computations, there should be eight multiple pulses per inch, and the photographs show seven.

SECTION V
EFFECT OF PULSE LENGTH AND MATERIAL THICKNESS

If the thickness of a lamination is sufficiently small or if the pulse length is sufficiently large, the train of transmitted waves will merge into a single wave. For this to occur, the pulse length, λ, must be equal to or greater than twice the material thickness.

The previous example will serve to illustrate this. The velocities of pressure waves in aluminum and water are approximately 20,900 and 5,200 ft/sec, respectively. With the aluminum plate having a thickness of 0.25-in., the wave length in the aluminum must be at least 0.50-in. in order that the first and second pulses, the second and third, the third and fourth, etc. will merge. If the wave length is as great as 1.0 in., the first, second, and third will overlap. The effect of the wave length upon the profile of the transmitted pulse is shown in Fig. 12, where it is assumed that the initial pulse in the aluminum plate was a step-function having length λ and amplitude P_o. In this example if λ is less than 0.50-in., the transmitted wave would be a series of separate and distinct pulses having amplitudes as shown in Fig. 10. The pulse length in the water would be the ratio of the pulse velocity in water to that in aluminum times the pulse length in the aluminum, or

$$\lambda_W = \frac{c_W}{c_A} \lambda$$

This rate of decrease in amplitude is shown by the curve marked λ_1 in Fig. 12. If λ is greater than 0.5 but less than 1.0 in., the pulses will overlap, and the transmitted wave will rise in a stepwise manner from zero to point A and then decay stepwise along the curve indicated by λ_2. If λ had a value greater than 2 in. and less than 2.5 in., the pulse front would increase to point B and then decay along λ_5. If the wave length is very long, the amplitude of the transmitted pulse will continue to increase as shown by the curve OABC, approaching a maximum amplitude

of P_O. The effect of the original pulse profile in the aluminum plate upon the pulse transmitted into the water is shown in Fig. 13. Figure 13a shows the theoretical pulse resulting from the step pulse shown and is that described by the curve λ_5 of Fig. 12. Figure 13B shows the pulse in the water resulting from a sawtooth pulse in the aluminum plate. Although P_O and λ are the same, both the maximum amplitude and location of the peak pressure differ in the two examples given.

SECTION VI
SECONDARY PRESSURE WAVES

It has been shown that although the multiple reflections within a lamination converge very rapidly, they may contribute substantially to the amplitude of the transmitted stress waves. It will now be shown that this is especially true if conditions are such that these secondary waves combine in phase with other waves, producing a stress that may be greater than the primary wave P.

Laminates are generally constructed with alternate layers of equal thickness. This may or may not be advisable from a structural standpoint. A specific case will be given as an example. Figure 14 is a distance-time plot of the pressure pulse through a composite laminate in which the even numbered laminations are all of the same material and have equal thickness. The odd numbered layers, of another material, also are equal in thickness, and the impedance mismatch has a value of 0.5. The wave front is designated by P, the values of which are given both in the Appendix and Fig. 7. The first of the internal reflections, A and B and their transmitted components, AA and BB, are shown and their values may be determined by reference to the Appendix. (Notation used here is defined in Fig. 9.) The amplitudes of the primary wave front, P, and the first forward-moving internal reflection, B, are given in Fig. 15. The amplitude of B, given by Eq. (20), has a value of $0.111 P_N$ when K = 0.5. The amplitude of B_1 is $0.074 P_O$ and that of the transmitted wave, BB_1, is $0.099 P_O$. The front of BB_1 reaches the interface between the laminations 2 and 3 at exactly the same time as A_3. The transmitted component of BB_1 is $\left[2K/(K + 1)\right] BB$, or $0.066 P_O$. The amplitude of B_3 (the reflected component of A_3) also has a value of $0.066 P_O$, giving the first forward-moving secondary wave in the third lamination a value of $0.132 P_O$. This continues through the laminate, being reinforced in the odd numbered laminations. The amplitude of this wave is designated as B'. The value of B' for any value of N may be found by the relation

$$B_N' = \frac{N}{2} B_N \qquad (22)$$

if N is even, and

$$B_N{}' = \frac{N+1}{2} B_N \tag{23}$$

if the value of N is odd. A plot of the amplitude of B' is shown in Fig. 15. It may be seen that for this case of K = 0.5, B' increases in amplitude up to the eighteenth lamination, after which it decreases as shown.

The lamination in which B' is a maximum may be found by writing the expression for B' by combining Eqs. (15), (20), and (22) giving

$$B' = \frac{N}{2} \left[\frac{1-K}{1+K} \right]^2 \left[\frac{2\sqrt{K}}{1+K} \right]^N P_0 \tag{24}$$

for even values of N. Differentiating with respect to N and equating to zero, this gives

$$e^{1/N} = \frac{1+K}{2\sqrt{K}} \tag{25}$$

The same relation is obtained by using the equation for B' for an odd number of laminations. When using Eq. (25) to determine the lamination in which the amplitude of the secondary wave B' reaches a maximum value, the nearest even value of N should be used for values of K less than unity and the nearest odd value for values of K greater than unity.

Referring again to Fig. 14, it is seen that reinforcement of pressure waves also occurs in the even numbered laminations, resulting in the wave indicated as B''. The amplitude of B'' is the same as that of B' in the even numbered layers but has a different value in the odd layers, this being

$$B_N{}'' = \frac{N-1}{2} B_N \tag{26}$$

Values of the amplitude of B'' for both even and odd numbered laminations are shown in Fig. 15.

SECTION VII
FURTHER EFFECTS OF LAMINATION THICKNESS

Suppose that the thickness, t_1, of the odd numbered laminations of Fig. 14 is decreased. This will result in the front of the primary pressure wave P and that of the secondary wave B' coming closer together. As the thickness t_1 approaches zero, the amplitude of the wave front will approach the value of P + B'. Although t_1 must have a finite thickness (Ref. 8), the amplitude may actually have this value because a

pressure pulse generally rises rapidly from zero to a maximum and has a zero slope at that point (Ref. 9). Similarly, the amplitude of the wave front will approach $P + B''$ if the thickness of the even numbered laminations, t_0, is decreased to a small value. The sums $P + B'$ and $P + B''$ for $K = 0.5$ are shown on Fig. 15.

Although the sum of the primary and one of the secondary waves never exceeds the value of P_O, the pressure is much greater throughout the laminate than would have been computed if the effect of the secondary pulse had not been considered.

If the relative thickness of the laminations is such that

$$t_0/t_1 = c_0/c_1 \tag{27}$$

the fronts of the two waves B' and B'' will coincide, giving a secondary wave of amplitude

$$B_N' + B_N'' = N B_N \tag{28}$$

in all laminations, both even and odd. Figure 16 shows a distance-time plot of the wave fronts for this condition for the case where $K = 0.5$, and Fig. 15 shows the variation of the amplitude versus lamination number. Graphs of $B' + B''$ for values of K ranging from 0.1 to 10.0 for up to thirty laminations are given in Fig. 17. Curves showing the pulse amplitudes in the even numbered laminations for values of $K < 1$ are shown in Fig. 18. The relation given by Eq. (25), which also may be expressed in the form

$$N = \frac{-1}{\ln \frac{2\sqrt{K}}{1 + K}} \tag{29}$$

gives the lamination number in which the amplitude $B' + B''$ is a maximum. This value is given by the curve for N_1 shown in Fig. 19.

When the ratio of the wave velocities in the two media is very large (or very small) and the lamination thickness is in the same proportion, the leading edges of the waves P and $B' + B''$ will be very close together, and the resulting pulse amplitude will probably be the sum of the two. This will also be true in any case where the pulse has a very long wave length. The sum, $P + B' + B''$, is shown for K having a value of 0.5 in Fig. 15. For these conditions, the resulting pressure in the laminate is greater than the pressure would have been in a solid target. Graphs of $P + B' + B''$ for values of K ranging from 0.1 to 10.0 for up to thirty laminations are given in Fig. 20. Curves showing the pulse amplitudes in the even numbered layers for values of $K < 1$ are shown in Fig. 21.

The expression for the amplitude of this pulse for even values of N is

$$P + B' + B'' = \left[\frac{2\sqrt{K}}{1+K}\right]^N \left[1 + N\left(\frac{1-K}{1+K}\right)^2\right]P_o \tag{30}$$

The lamination in which the pulse amplitude is a maximum is found by differentiating this expression with respect to N and equating to zero. This gives

$$N = -\left[\frac{1}{\ln\frac{2\sqrt{K}}{1+K}} + \left(\frac{1+K}{1-K}\right)^2\right] \tag{31}$$

These values are given by the curve N_2 of Fig. 19.

The third wave shown in Fig. 16 is a tensile or release wave. Although this wave is made up of many weak pulses meeting in phase (for example, sixty-five pulses combine to form this wave at the tenth lamination), it may contribute significantly to the stress developed in the target as shown in the following example.

Consider a target which consists of five laminations with an impedance mismatch of 0.5. (This would be the approximate value for a steel-lead or copper-aluminum combination.) The thickness of the first, t_0, and the last, t_4, is relatively large as shown in Fig. 22, and the thicknesses of the other laminations are such that $t_1 = t_3 = c_1 t_2/c_0$, where c_0 is the pulse velocity in laminations 0, 2, and 4, and c_1 is the velocity in 1 and 3. The distance-time plot (Fig. 22) of the wave fronts is shown with the amplitudes given for the last lamination for the case of a step-pulse having amplitude P_0.

First, consider the stress developed by the reflections from the rear surface if $\lambda < 2t_2$. The wave transmitted through the last lamination will consist of separate pulses as shown in Fig. 22a for time T_2. Upon total reflection, the maximum tensile stress will occur when the reflected first pulse interacts with the oncoming third pulse giving a tensile stress of 0.965 P_0. At time T_3, the pulse form is shown in Fig. 22c.

For $\lambda > 2t_2$, the waves transmitted through the last lamination will overlap and appear as shown in Fig. 22b. The reflected tensile wave will have a maximum amplitude of 1.23 P_0 at time T_4, as shown in Fig. 22d. This means that if this target had been constructed of copper-aluminum laminations, the tensile stress developed in the last layer of copper would have been 23 percent greater than if a solid copper target had been used.

SECTION VIII
DISCUSSION

According to these theoretical considerations, a few general conclusions may be drawn which, if properly observed, should lead to the use of laminates in such a way as to reduce the probability of damage produced by stress induced by explosions or impact.

1. The impedance mismatch should not have a value near unity.

2. The last layer of a laminate should be of the material having the least characteristic impedance.

3. The relative thicknesses of the two materials should not be in the same proportions as the wave velocities in the respective materials.

4. The laminations should be of sufficient thickness so as not to result in a superposition of the transmitted pulses.

5. The number of laminations should not be such that the maximum stress, according to Fig. 19, will occur in the last layer.

6. Alternate laminations should not be of the same thickness.

Further experimental work is needed to verify the validity of the assumptions made and the conclusions reached in this study.

REFERENCES

1. Summers, James L. and Nysmith, C. Robert. "The Resistance of Composite Space Structures to Hypervelocity Impact." AIAA Fifth Annual Structures and Materials Conference Proceedings, April 1964, p. 386.

2. McMillan, A. R. "An Investigation of the Penetration of Hypervelocity Projectiles Into Composite Laminates." Proceedings of the Sixth Symposium on Hypervelocity Impact, Vol. III, DA - 31 - 124 - ARO (D) - 16, Firestone Tire and Rubber Co., August 1963, p. 314.

3. Kinslow, Ray. "Observations of Hypervelocity Impact of Transparent Plastic Targets." AEDC-TDR-64-49 (AD 438947), May 1964, p. 7, 16.

4. Gehring, J. W., Christman, D. R., and McMillan, A. R. "Hypervelocity Impact Studies Concerning the Meteroid Hazard to Aerospace Materials and Structures." AIAA Fifth Annual Structures and Materials Conference Proceedings, April 1964, p. 78.

5. Kinslow, Ray. "Properties of Spherical Stress Waves Produced by Hypervelocity Impact." AEDC-TDR-63-197 (AD 421578), October 1963, p. 1.

6. Kolsky, H. Stress Waves in Solids. Dover Publications, Inc., 1963, p. 16.

7. Rinehart, John S. and Pearson, John. Behavior of Metals Under Impulsive Loads. The American Society for Metals, 1954, p. 31.

8. Clay, Robert Blaine. Formation and Behavior of Shock Waves in Solids. University of Utah Press, 1960, p. 26.

9. Rinehart, John S. "Some Quantitative Data Bearing on the Scabbing of Metals." Journal of Applied Physics, Vol. 22, No. 5, May 1951, pp. 555-560.
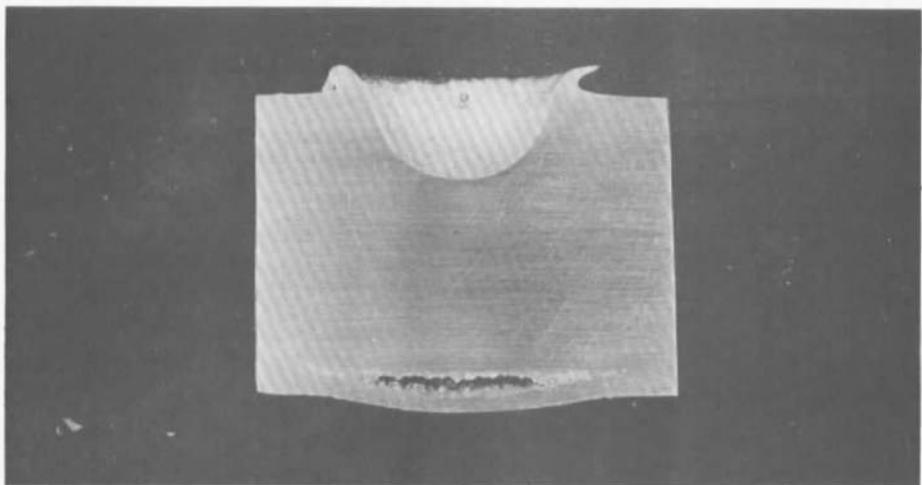
Target Material: Annealed Copper   Projectile Diameter: 3/16 in.
Target Thickness: 1 in.   Projectile Velocity: 20,000 ft/sec
Projectile Material: Aluminum   Projectile Shape: Sphere

Fig. 1 Fracture in a Solid Target
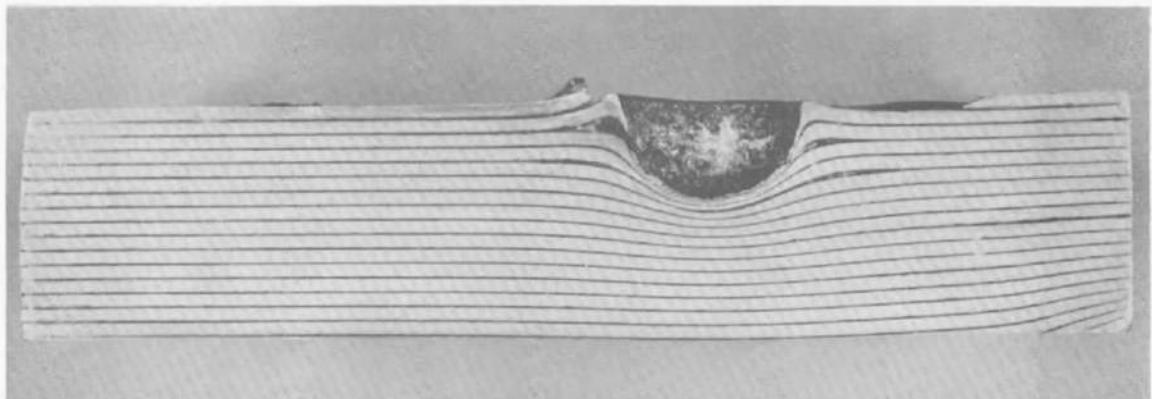
Target Material: Annealed Copper-   Projectile Diameter: 3/16 in.
                    Solder Laminate   Projectile Velocity: 21,300 ft/sec
Target Thickness: 3/4 in.   Projectile Shape: Sphere
Projectile Material: Aluminum

Fig. 2 Fracture in a Laminated Target
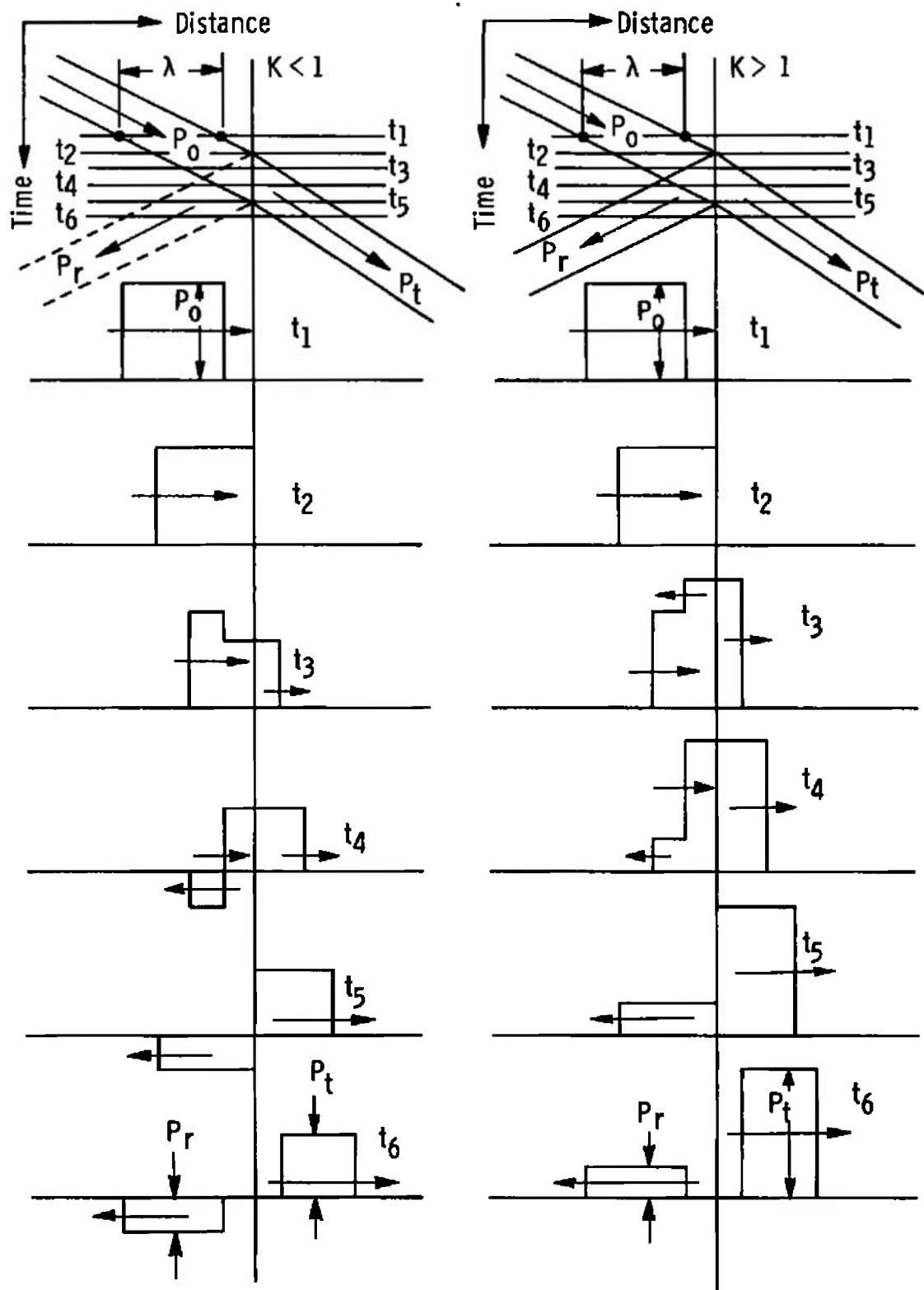
Fig. 3 Mechanics of Pressure Pulse at an Interface
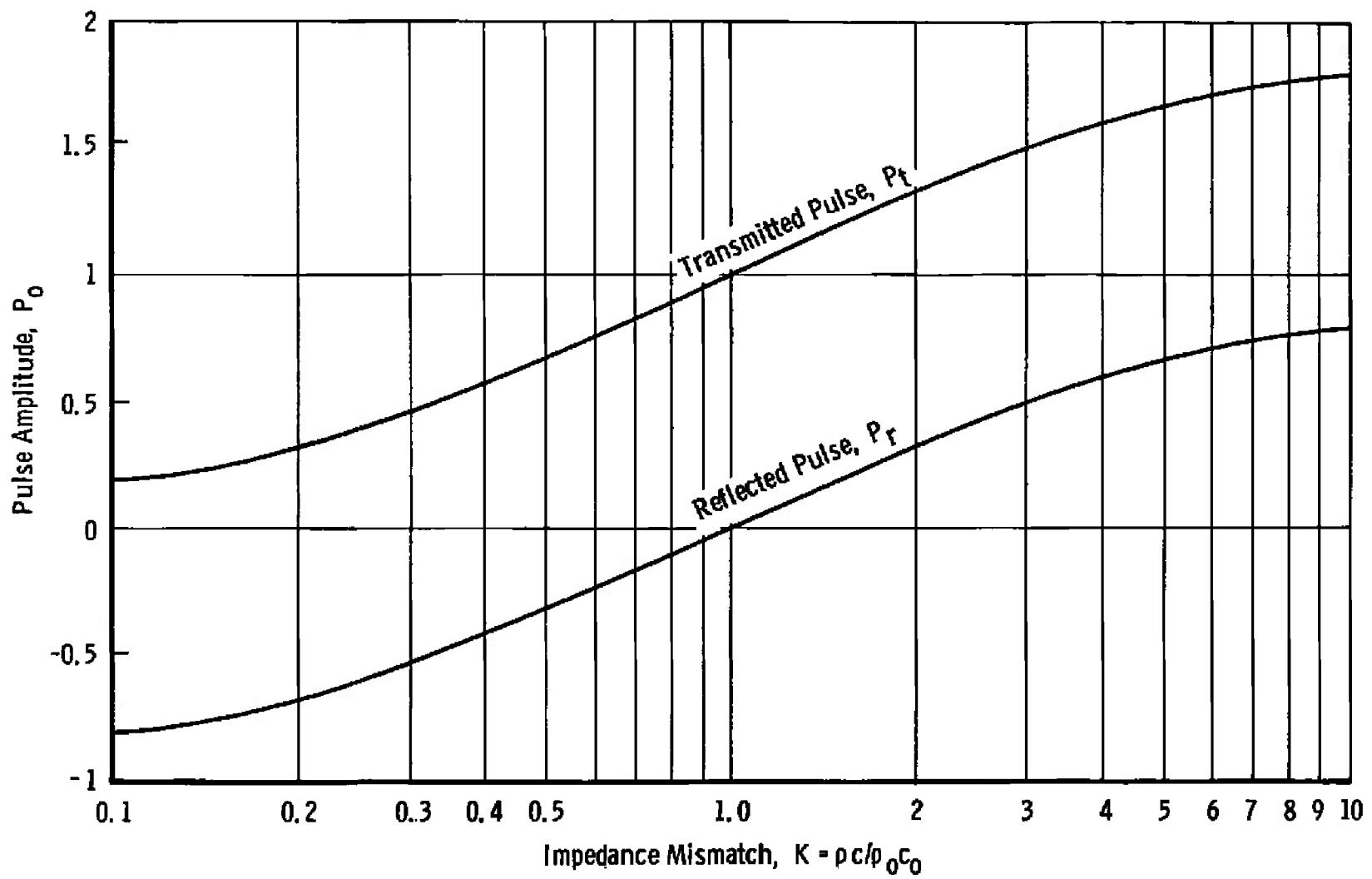
Fig. 4 Transmitted and Reflected Pulse Amplitudes as a Function of Impedance Mismatch
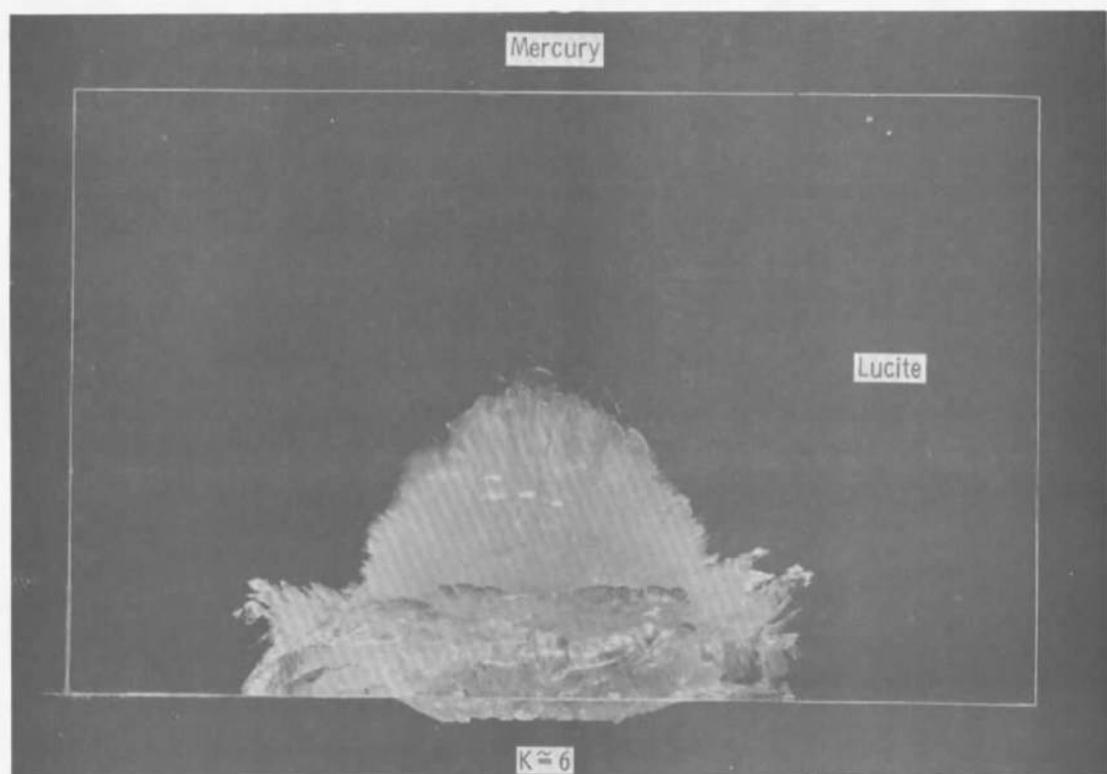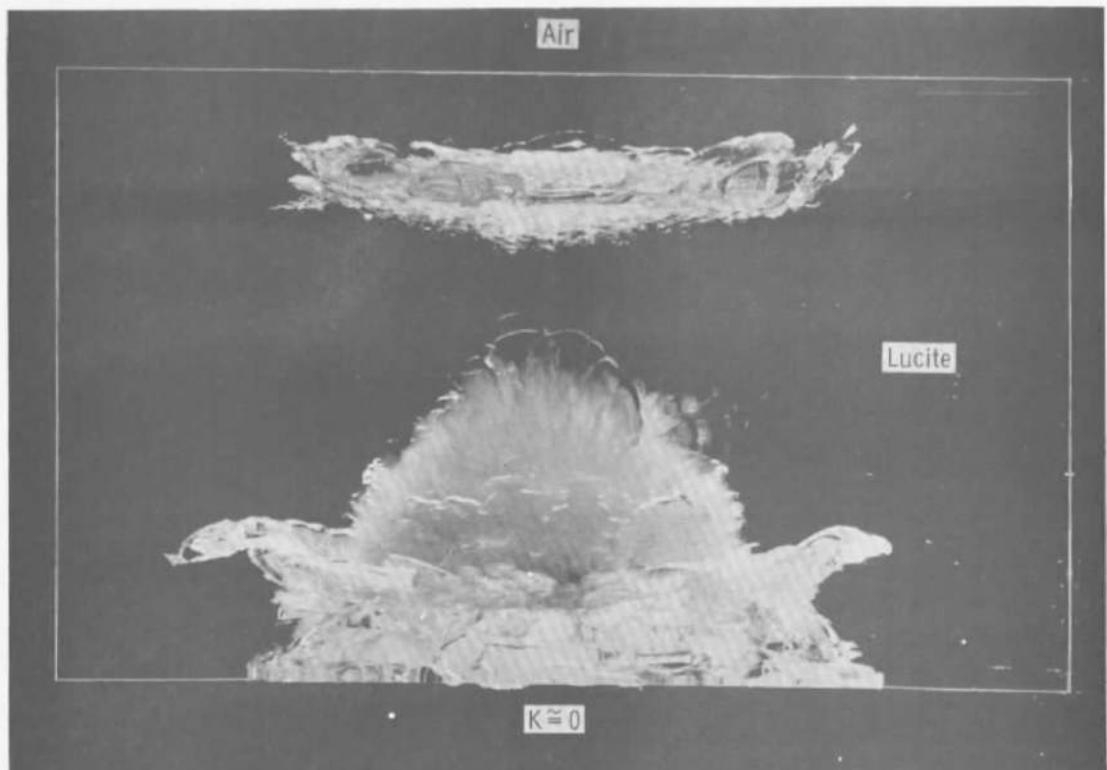
Fig. 5 Fractures in Plastic Blocks (Produced by Identical Blasting Caps)
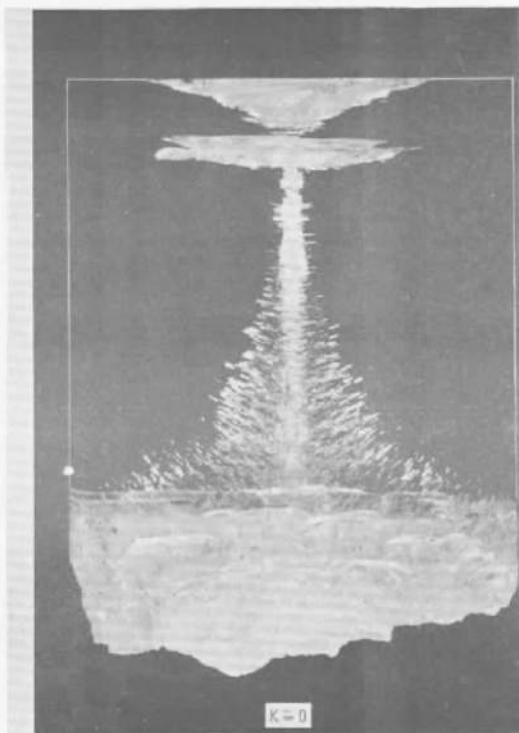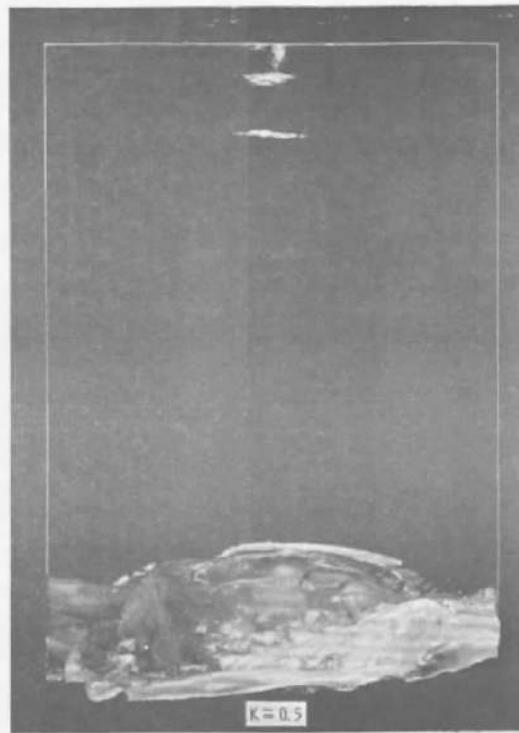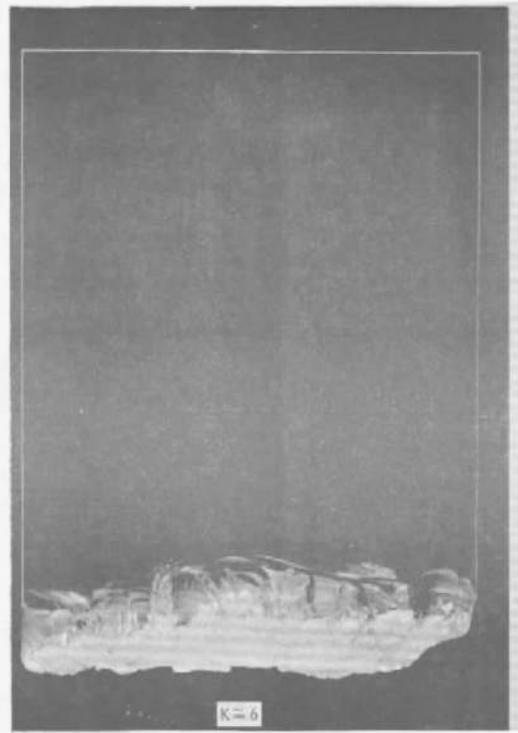
Fig. 6 Fractures in Plastic Cylinders (Produced by Identical Blasting Caps)
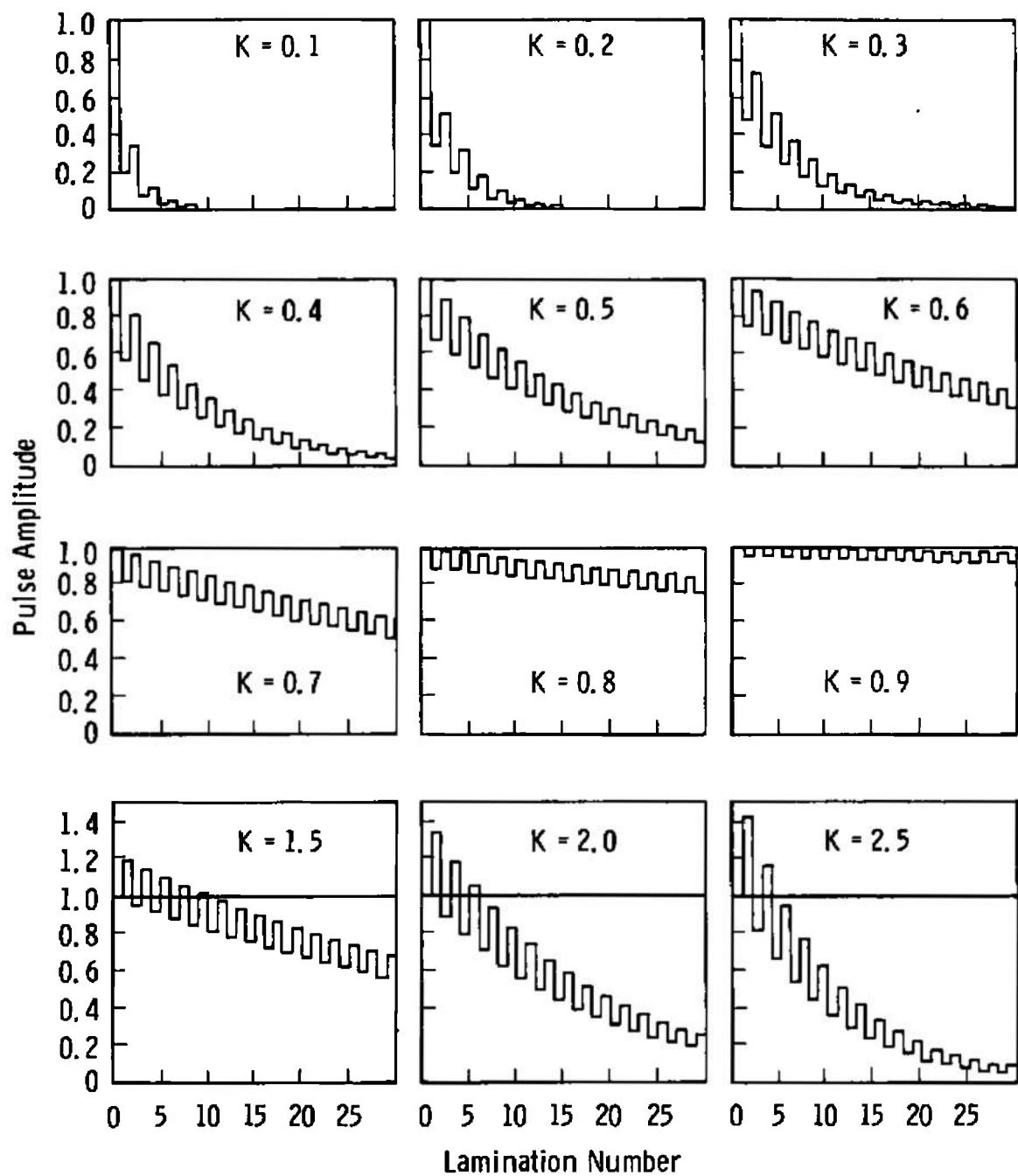
Fig. 7 Primary Pulse Amplitude
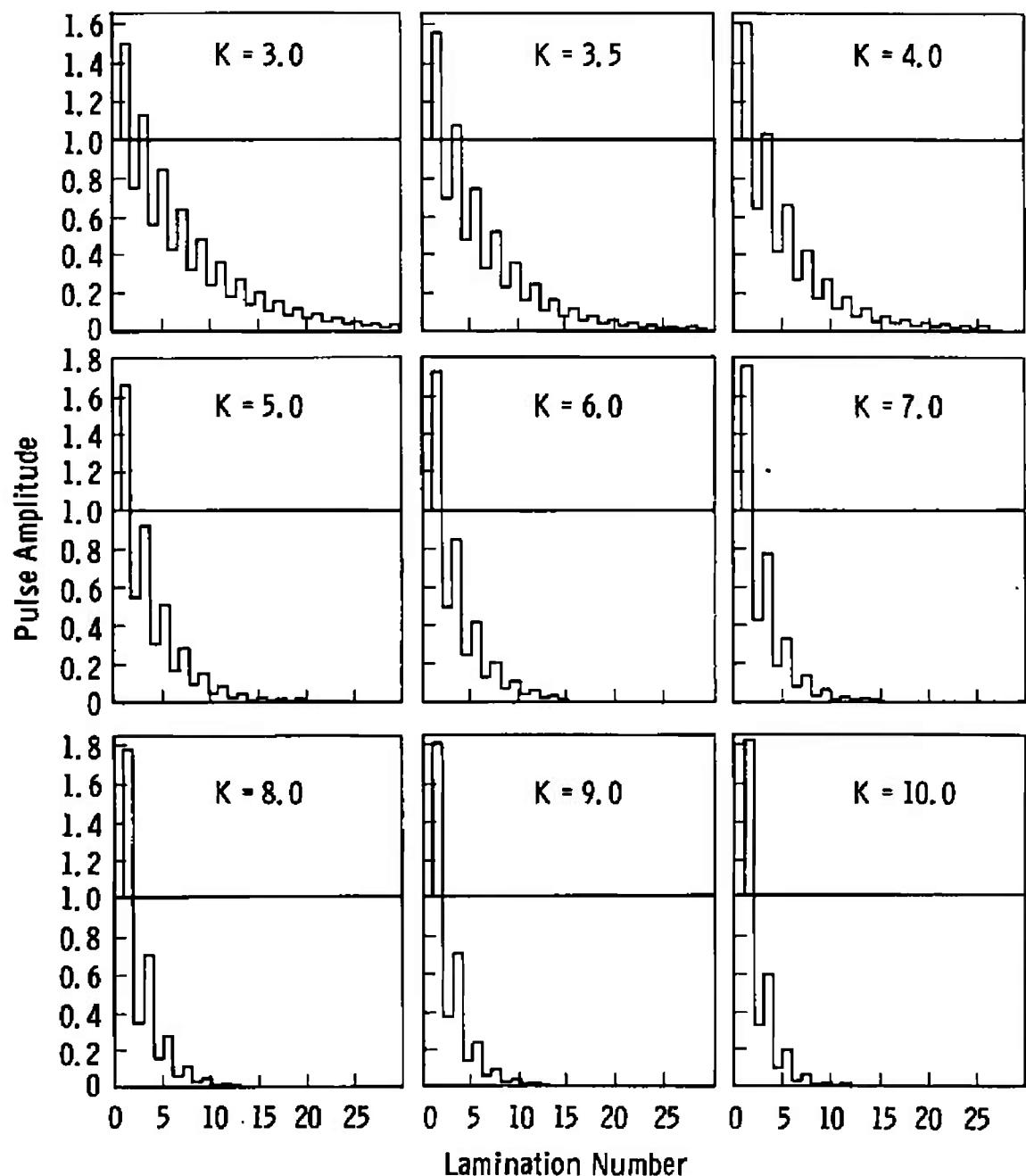
Fig. 7 Concluded
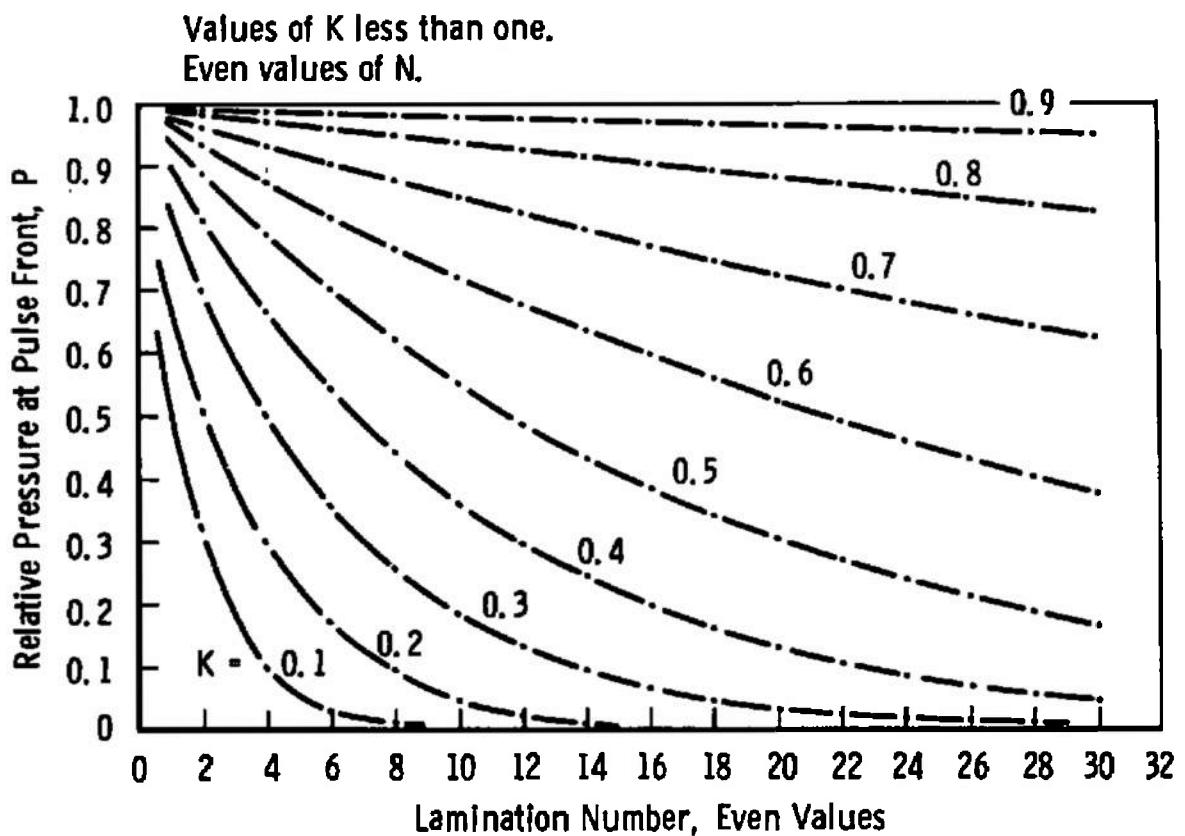
Fig. 8 Effect of Impedance Mismatch upon Primary Pulse Attenuation
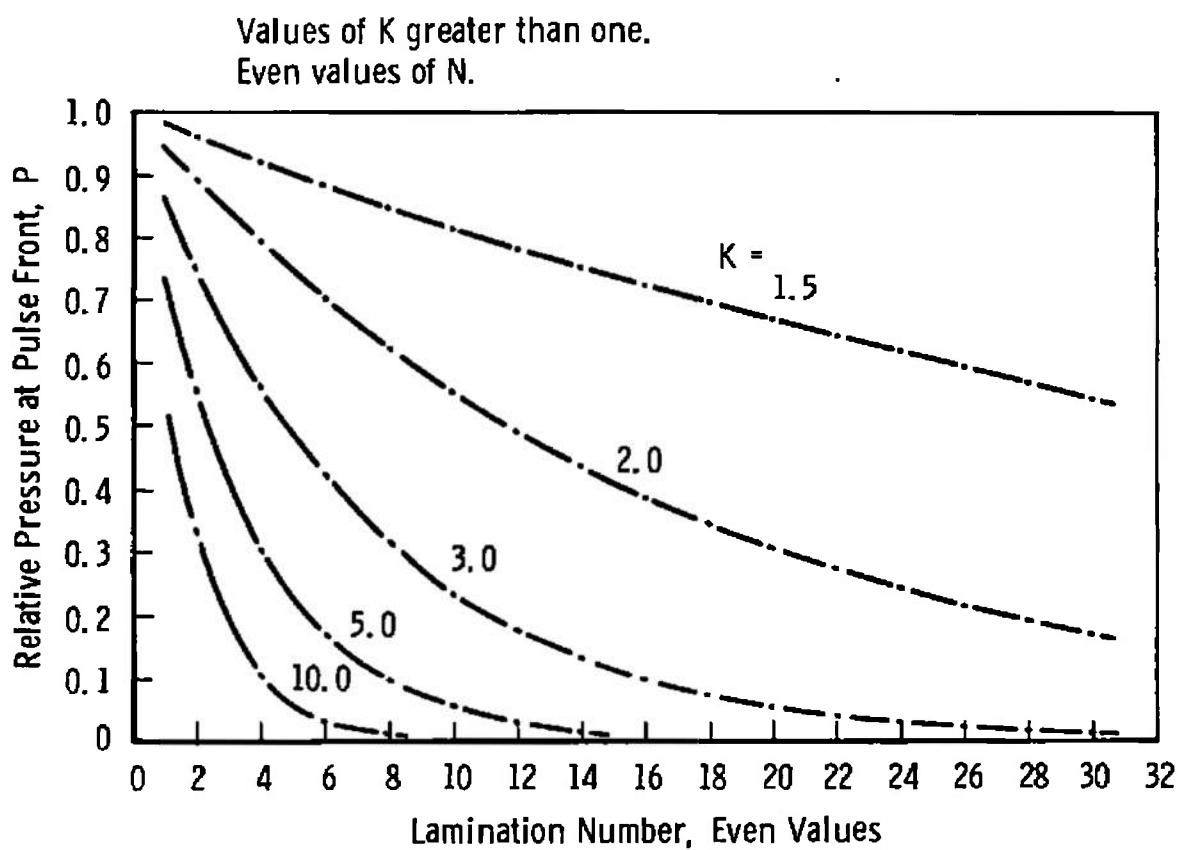
Fig. 8 Continued
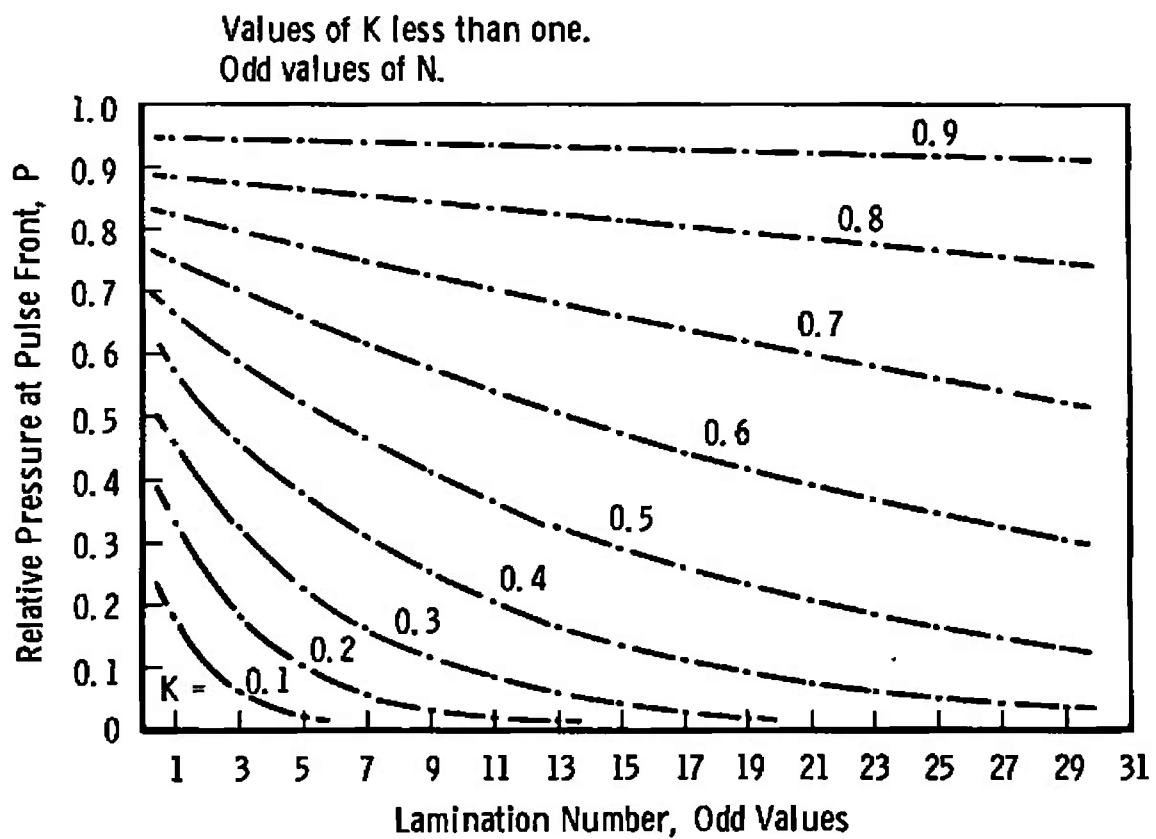
Fig. 8 Continued

Values of K greater than one.
Odd values of N.
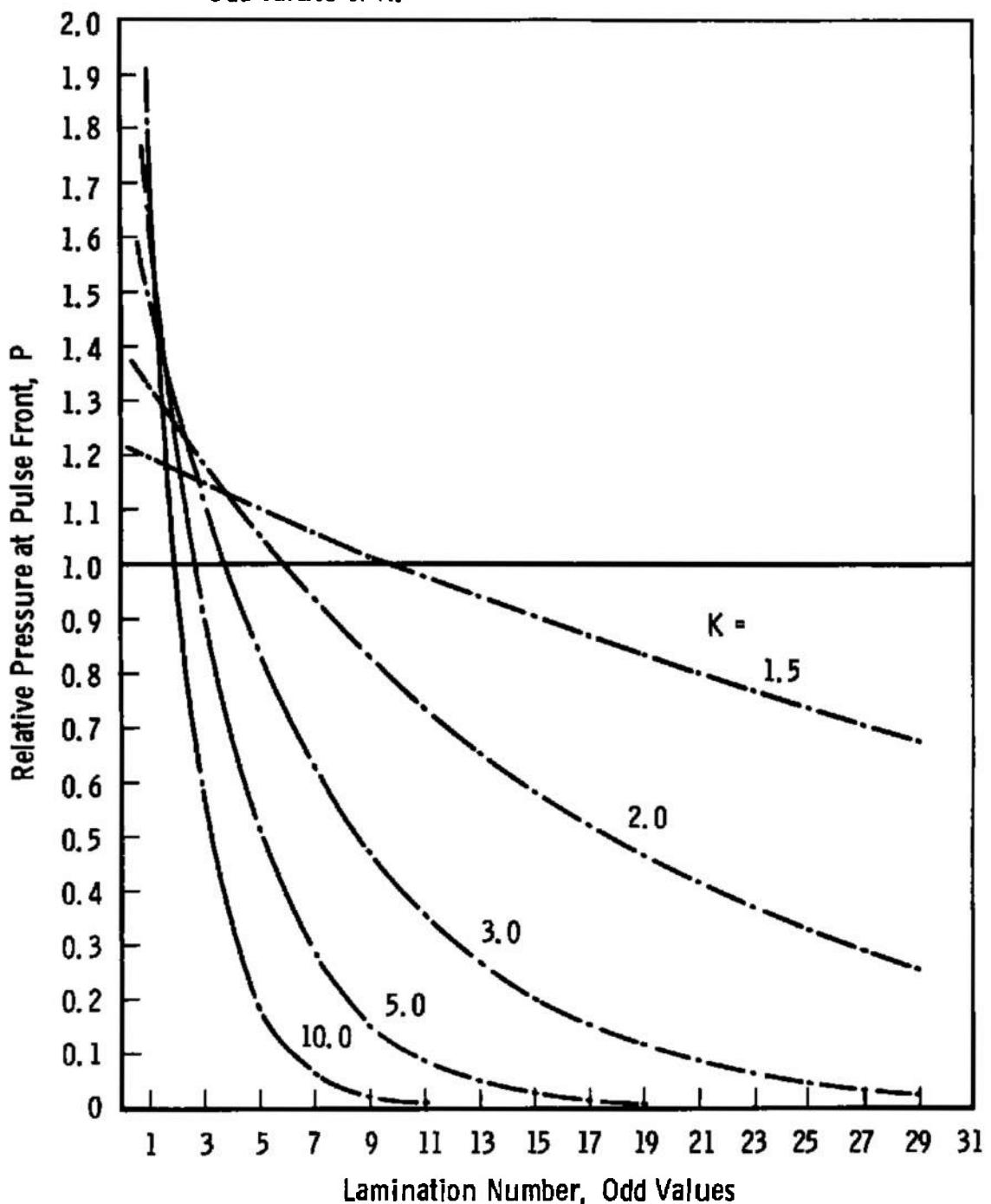
Fig. 8 Concluded
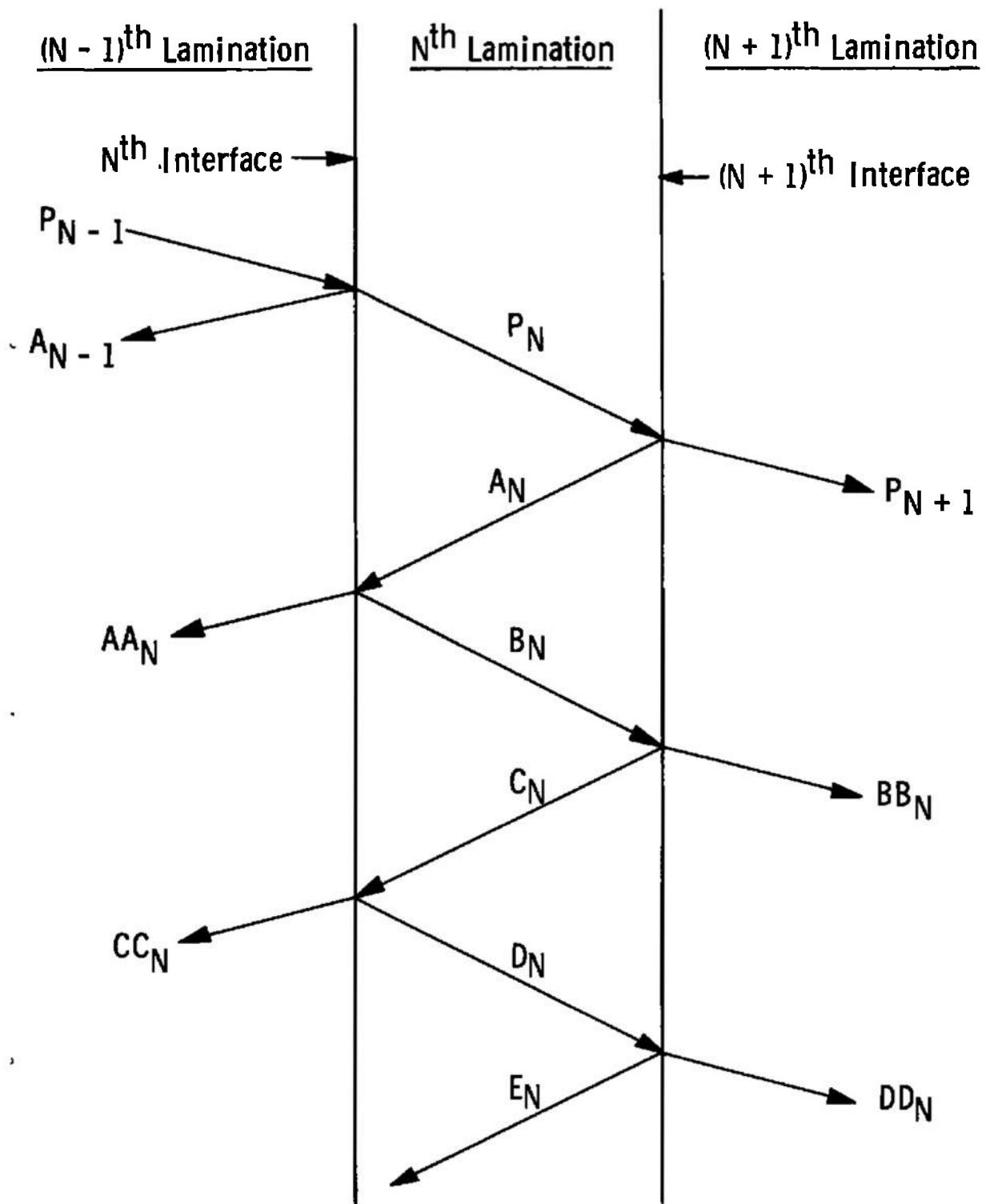
Fig. 9 Multiple Reflections within a Lamination
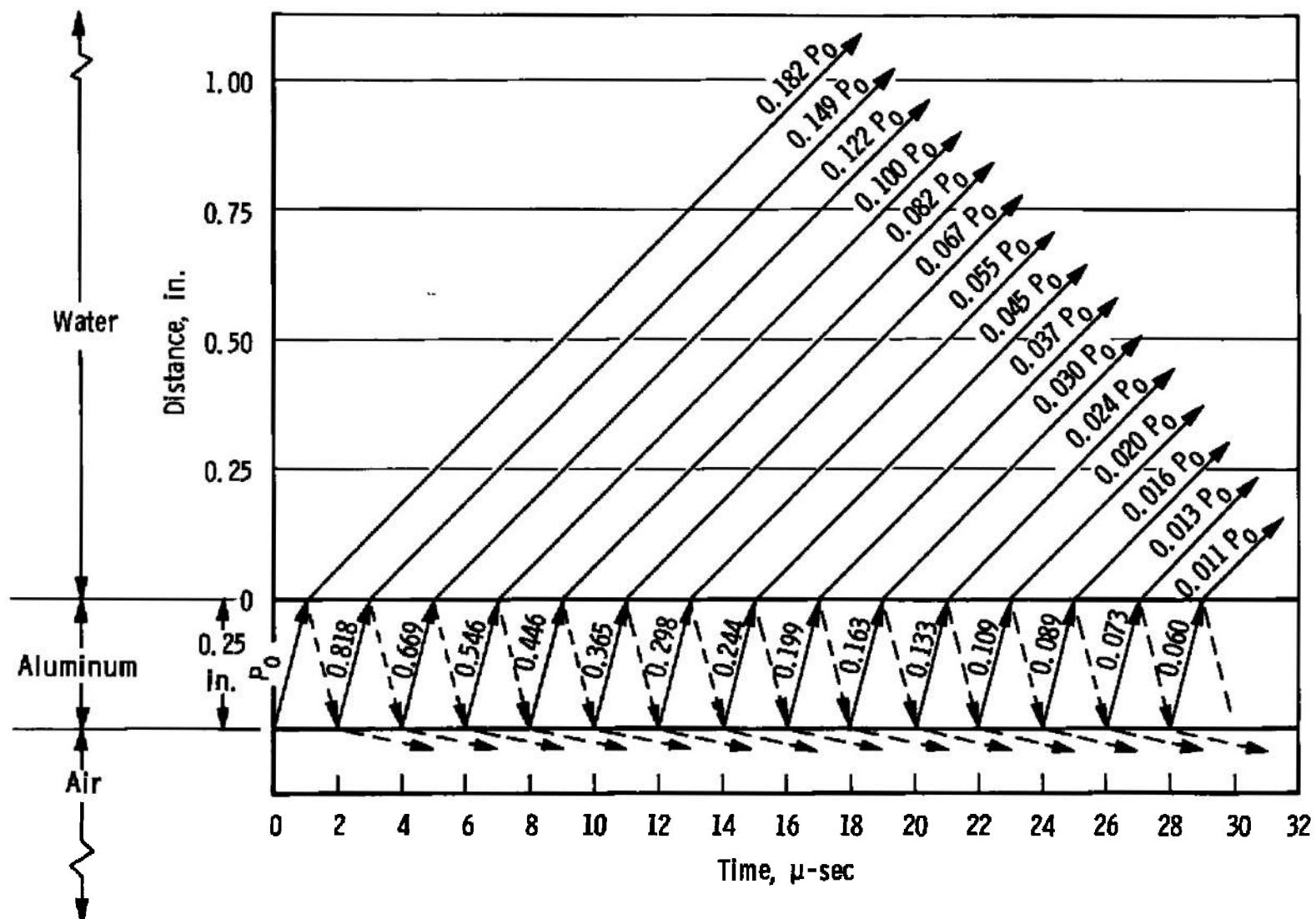
Fig. 10 Transmitted Waves in Water Produced by Multiple Reflections in Aluminum
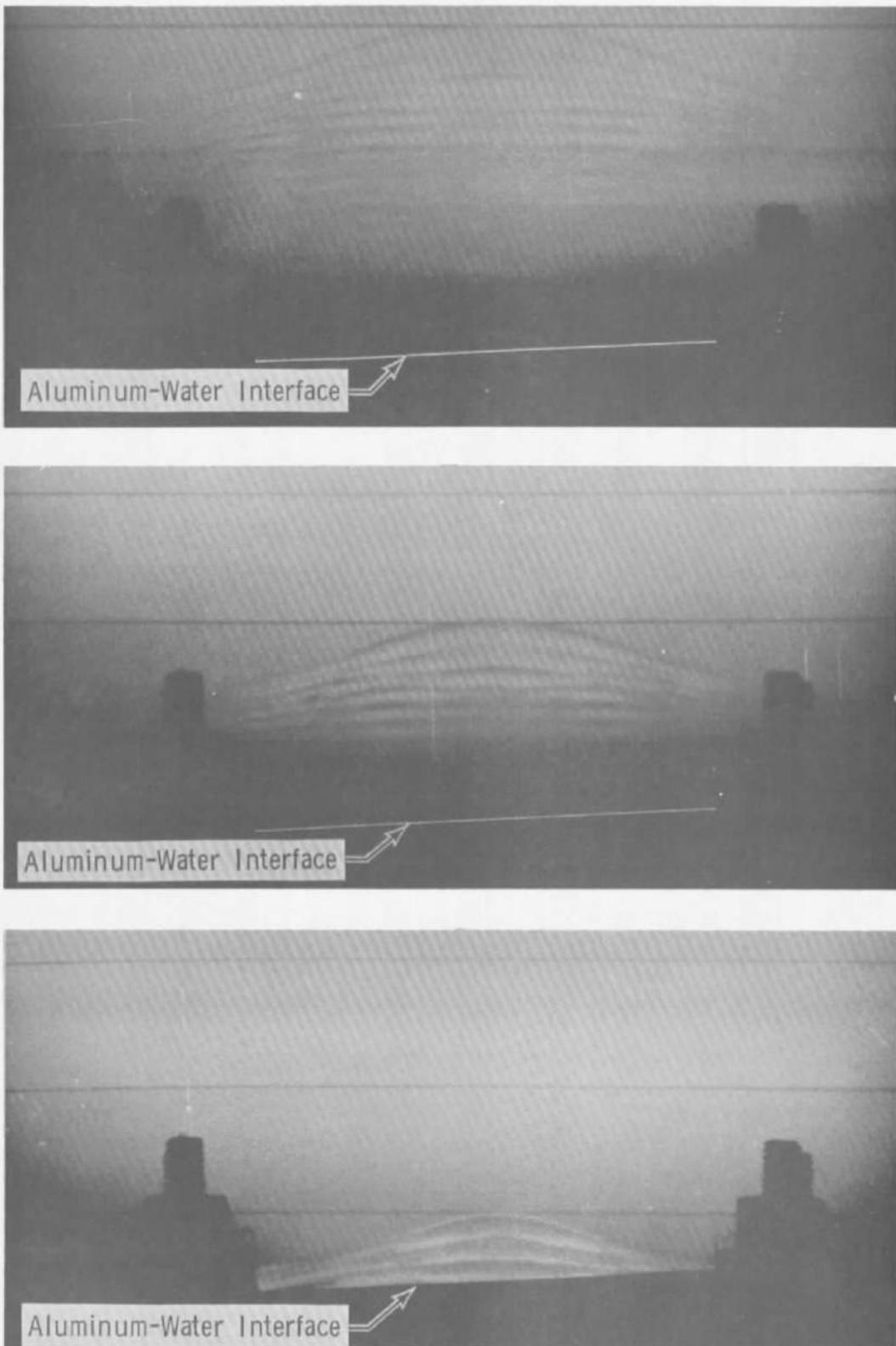
Fig. 11 Multiple Pressure Waves in Water
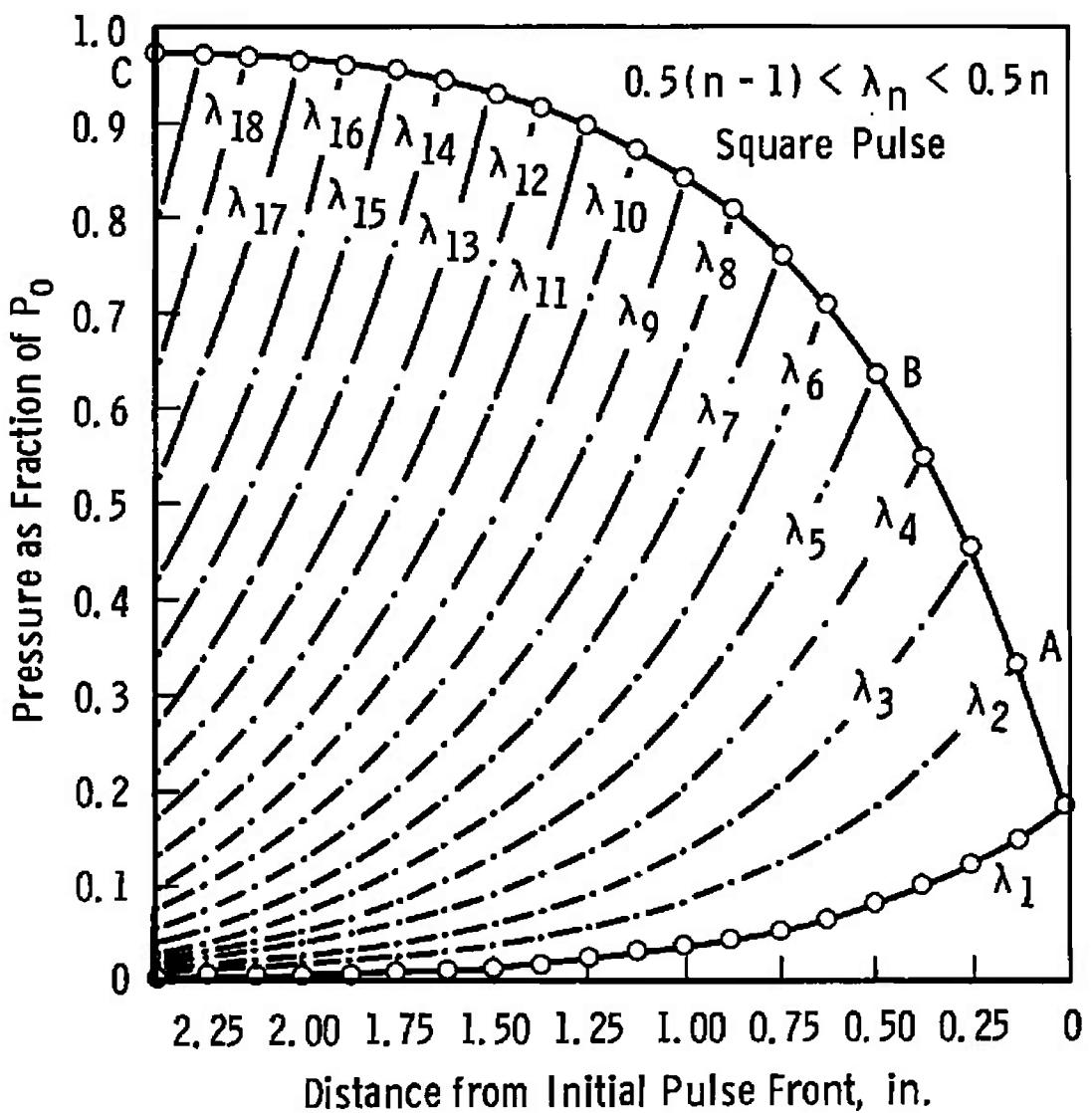
Fig. 12 Effect of Pulse Length upon the Transmitted Wave in Water
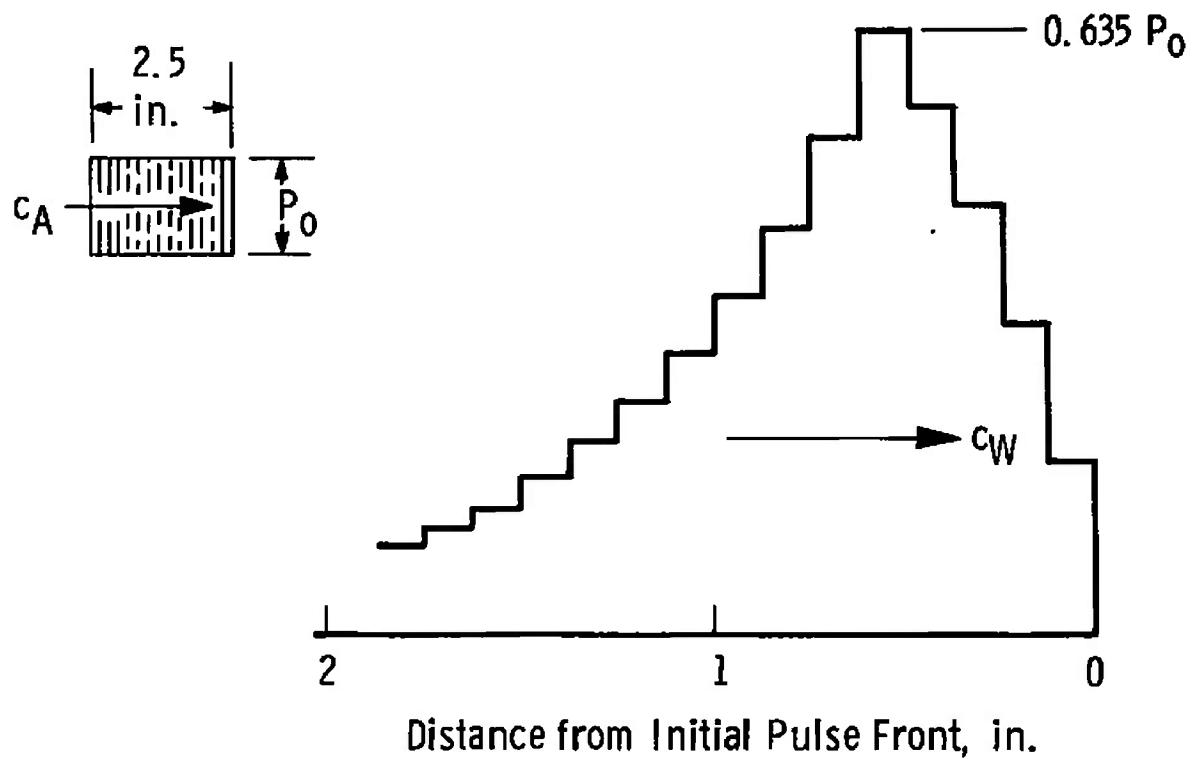
a. The above pulse in a 0.25-in. aluminum plate would transmit into water the wave shown
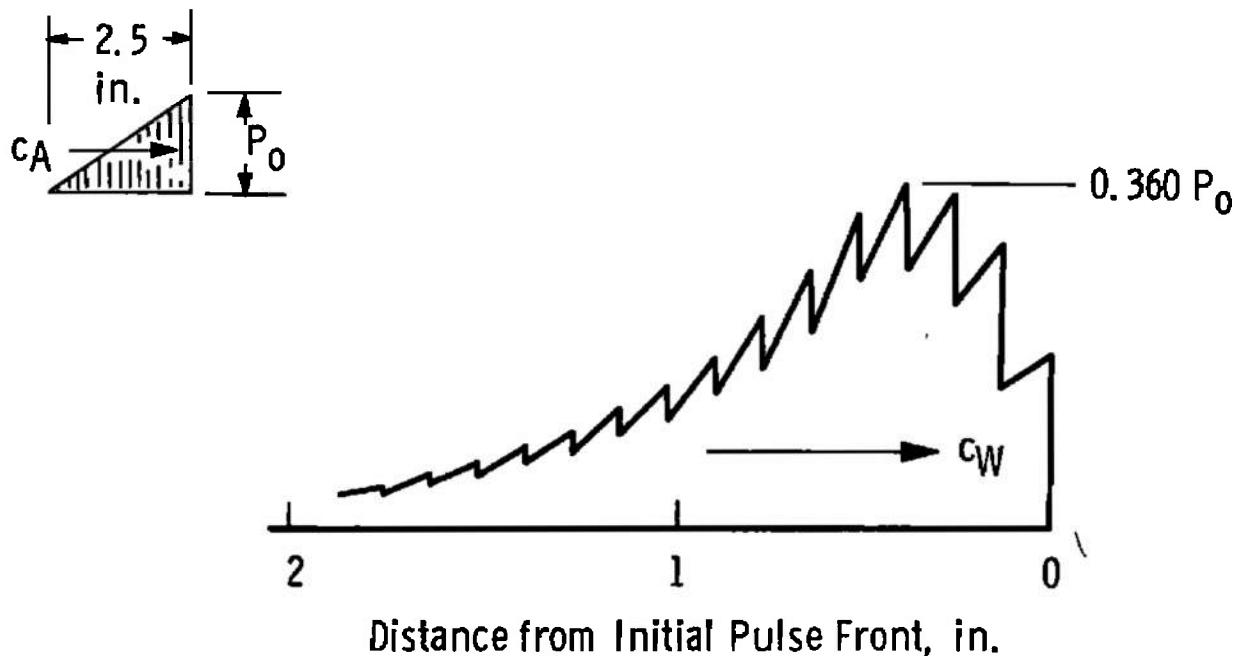
b. The above pulse in a 0.25-in. aluminum plate would transmit into water the wave shown

Fig. 13 Effect of Pulse Profile upon the Transmitted Wave in Water
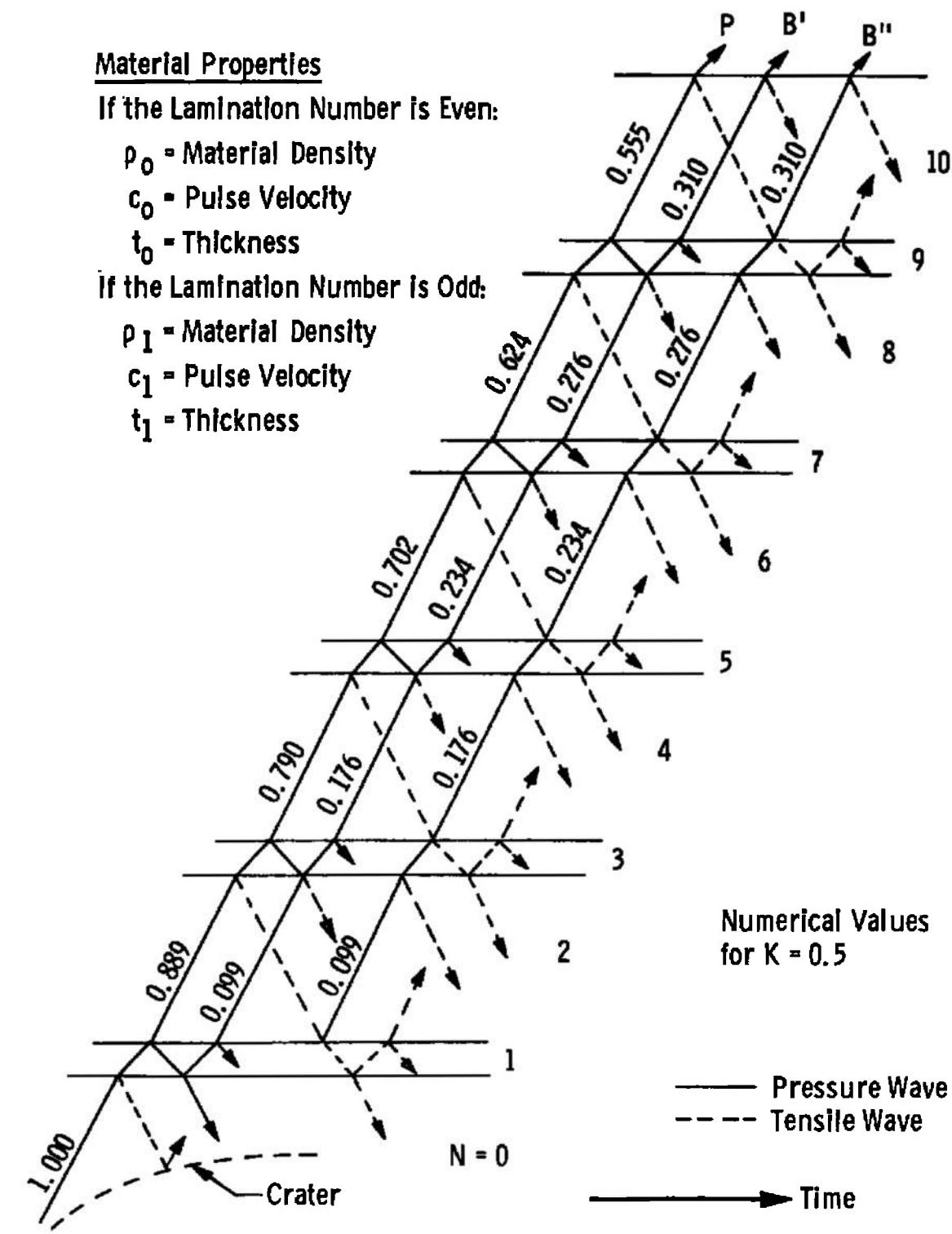
Fig. 14 Primary and Secondary Pressure Waves in Composite Laminates
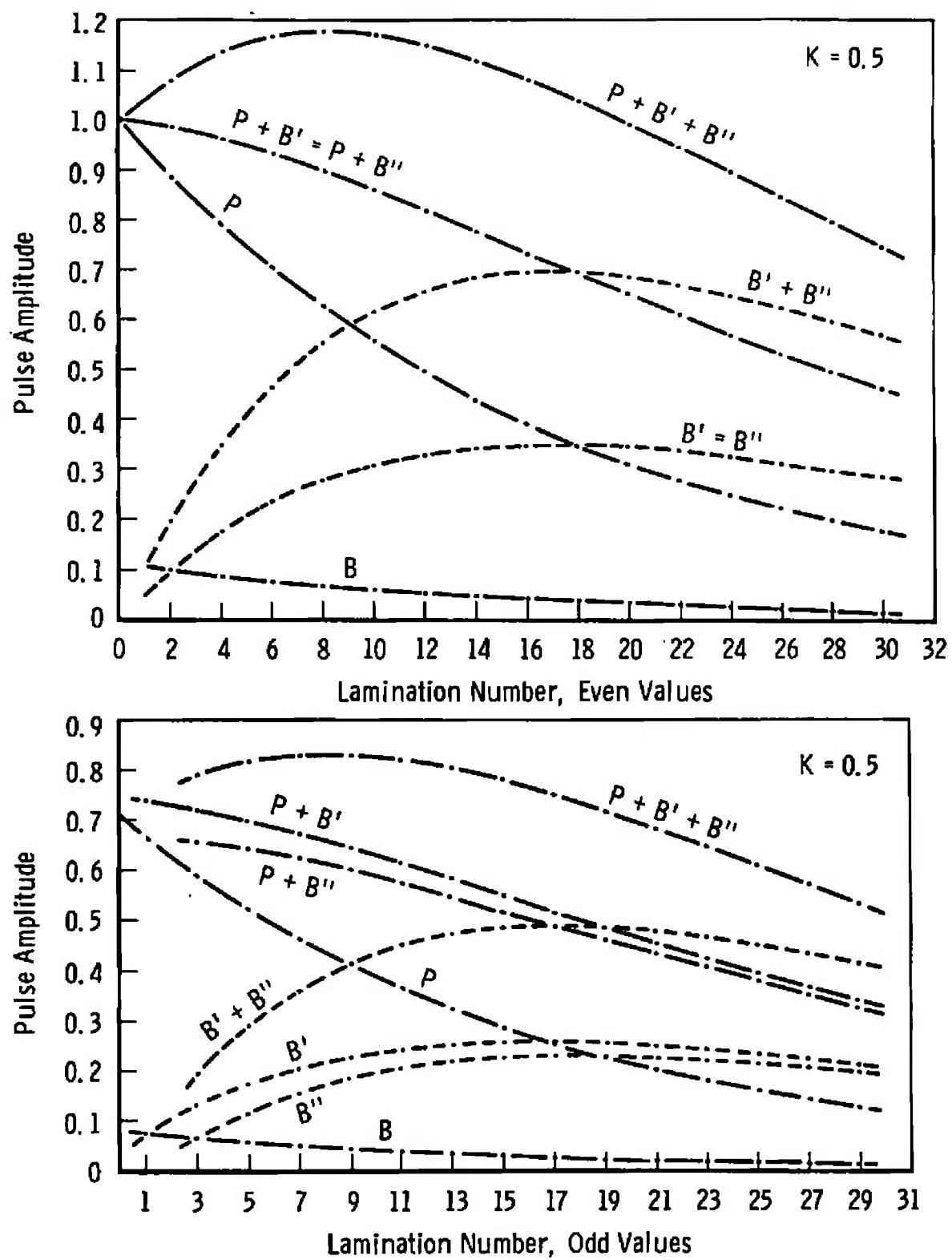
Fig. 15 Possible Combinations of Primary and Secondary Pressure Waves
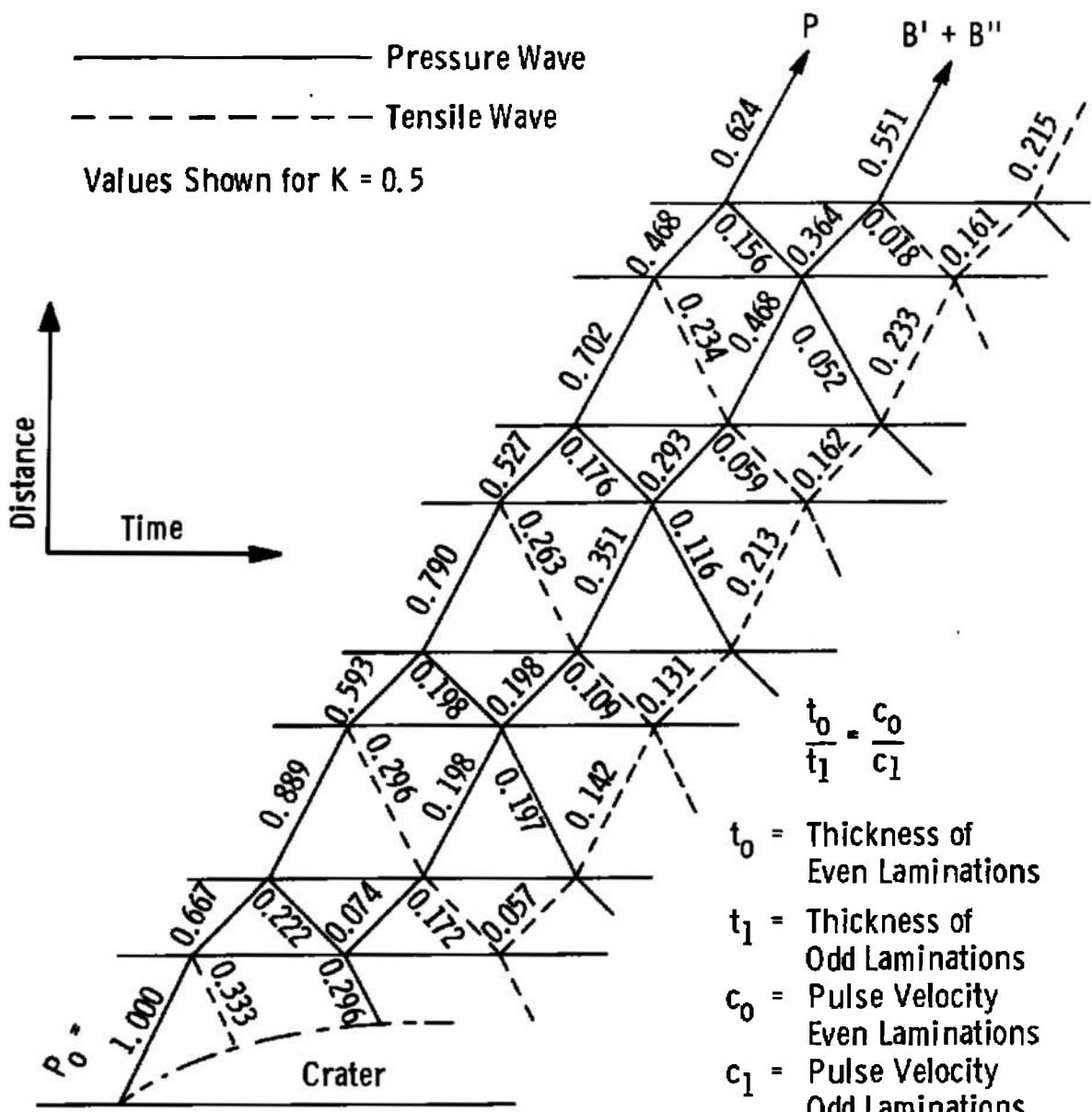
Fig. 16 Conditions for Maximum Amplitude of Secondary Pressure Waves
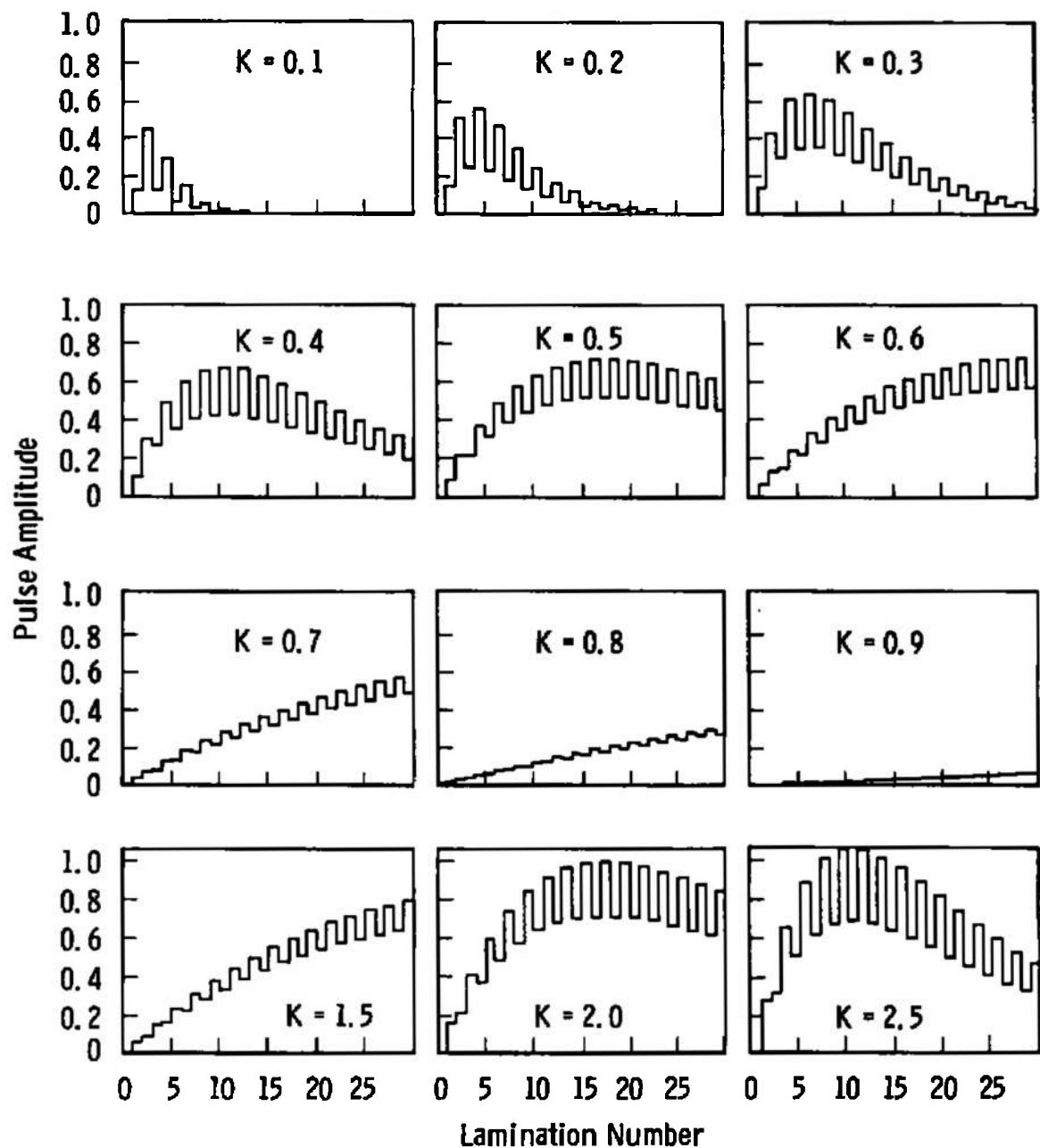
Fig. 17 Secondary Pulse Amplitude
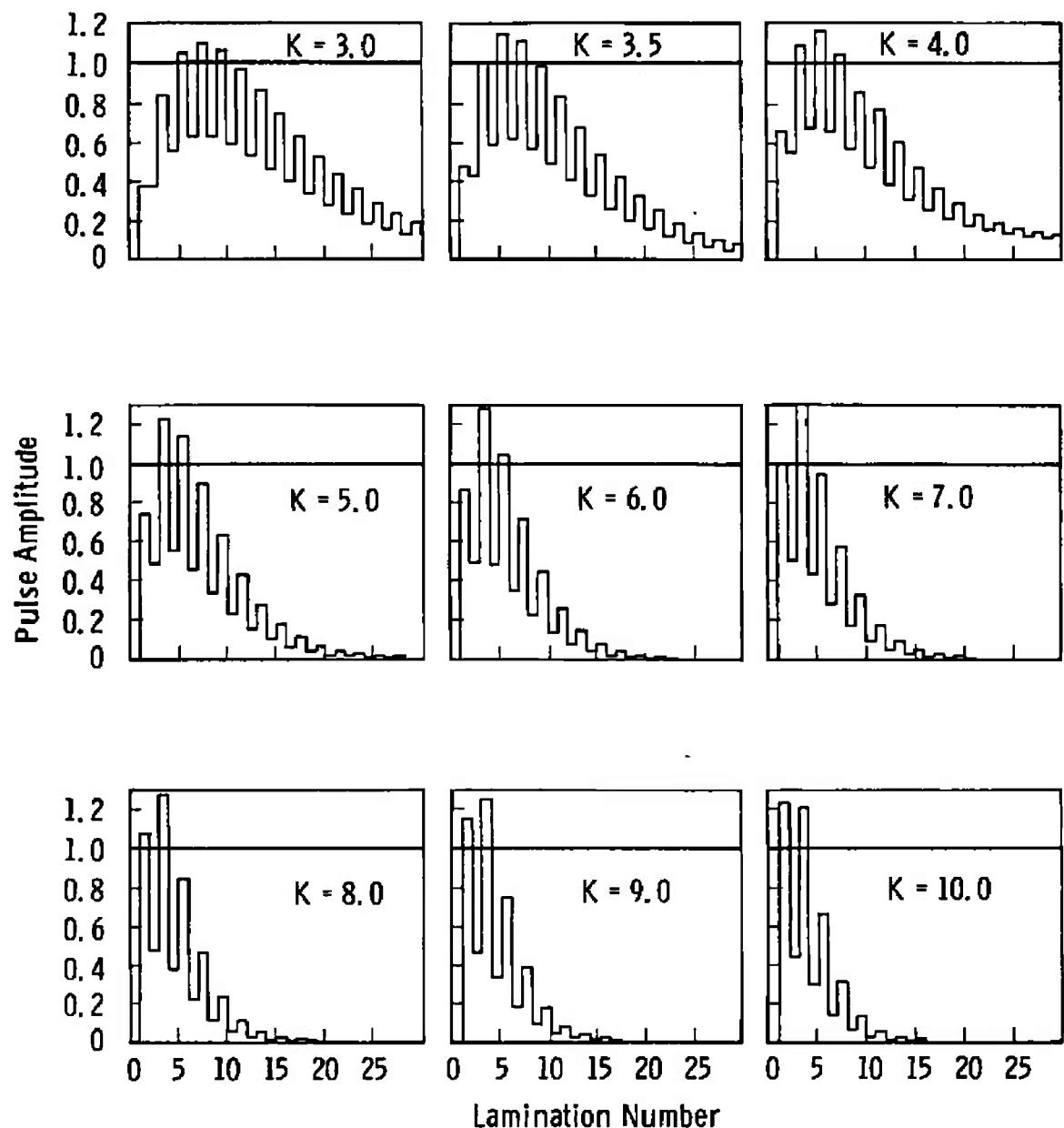
Fig. 17 Concluded
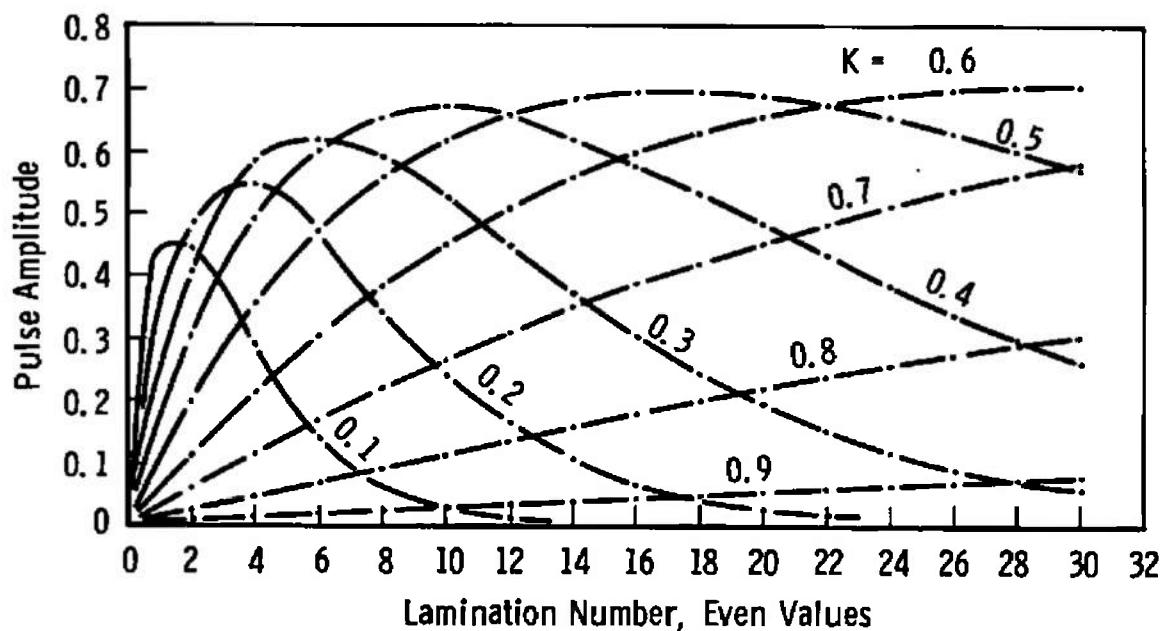
Fig. 18 Effect of Impedance Mismatch upon Amplitude of Secondary Pulses
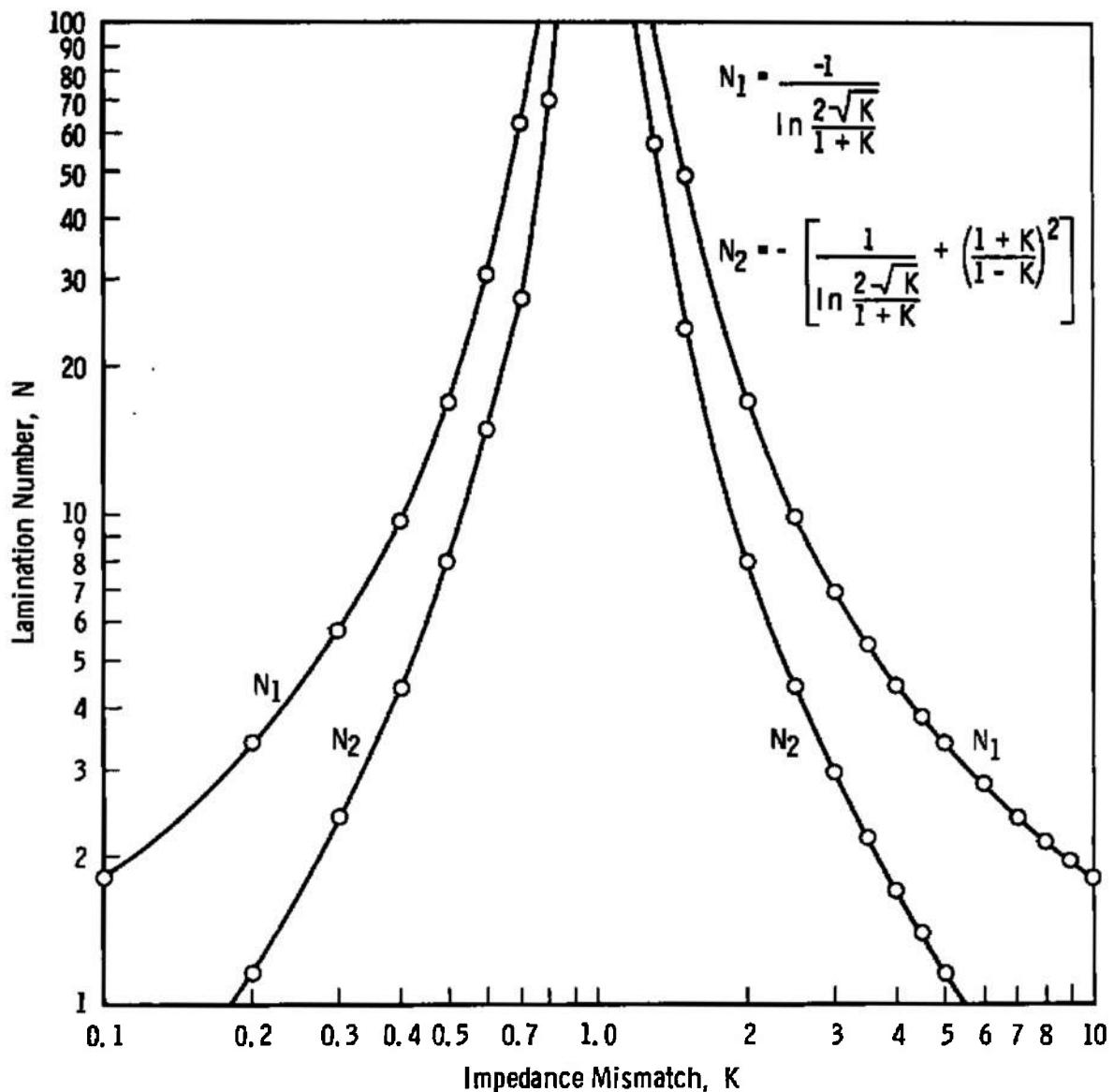
Fig. 19 Lamination Number at which Pulse Amplitude is a Maximum
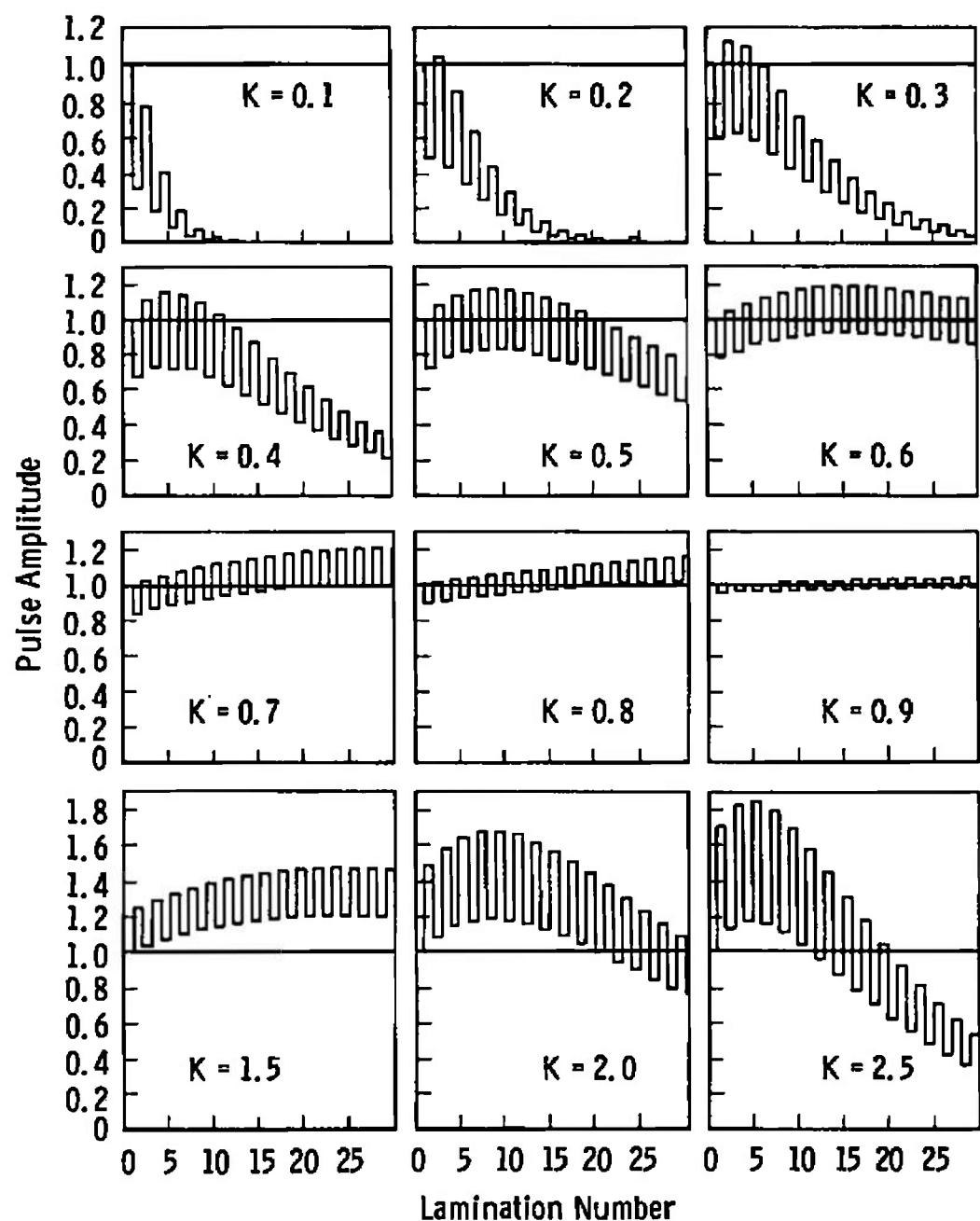
Fig. 20 Sum of Primary and Secondary Pulse Amplitudes
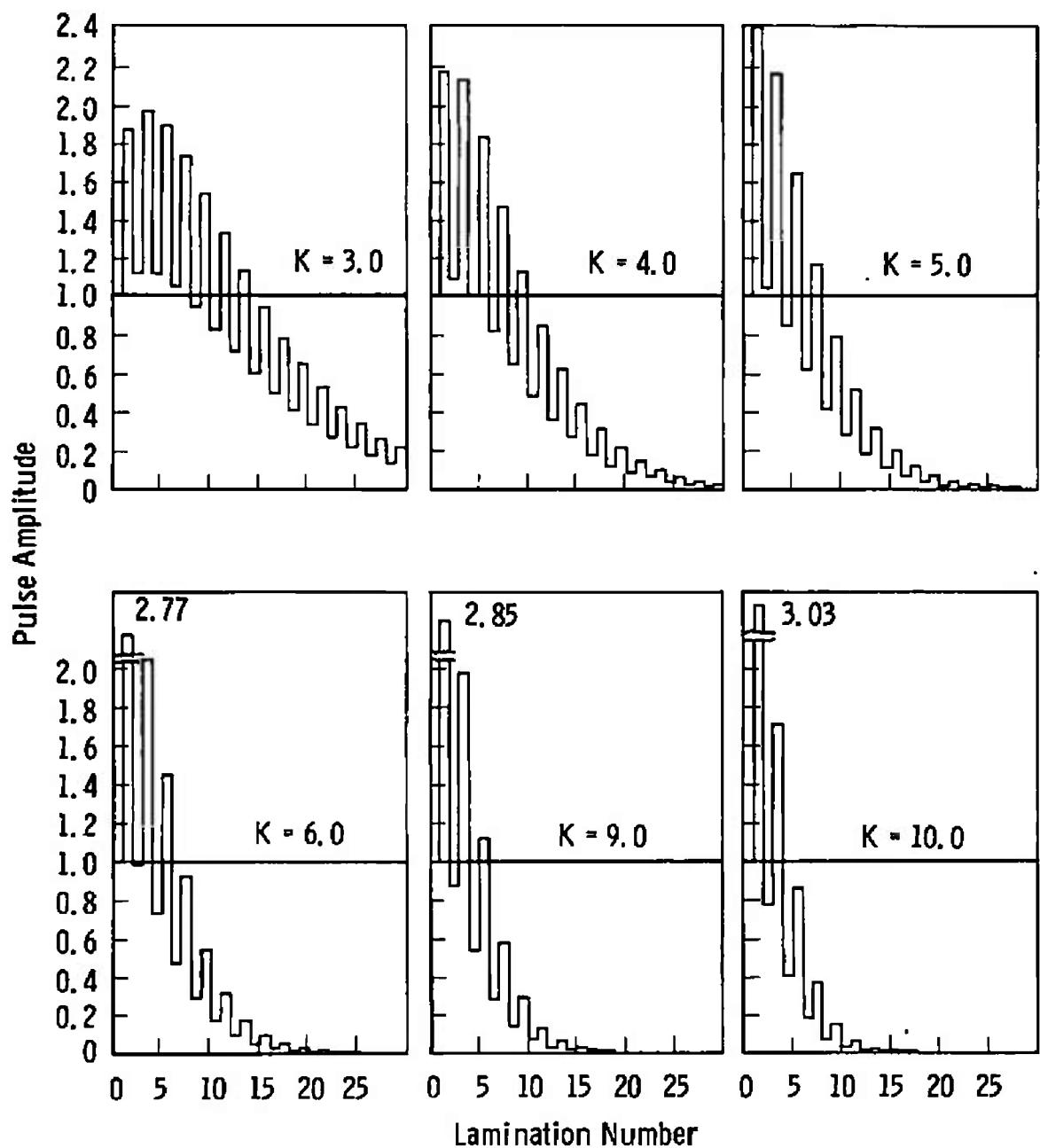
Fig. 20 Concluded
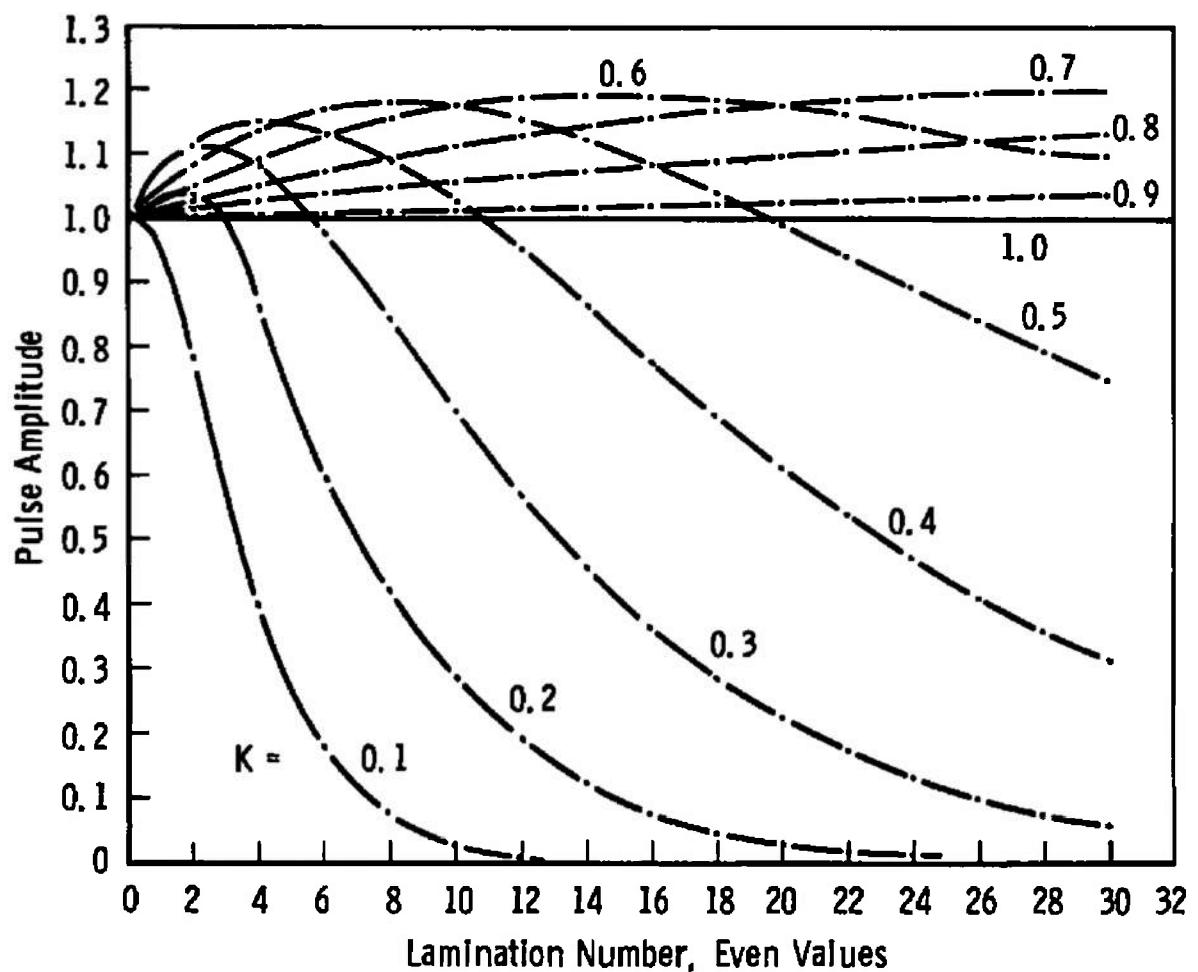
Fig. 21 Effect of Impedance Mismatch upon Sum of Primary and Secondary Pulse Amplitudes
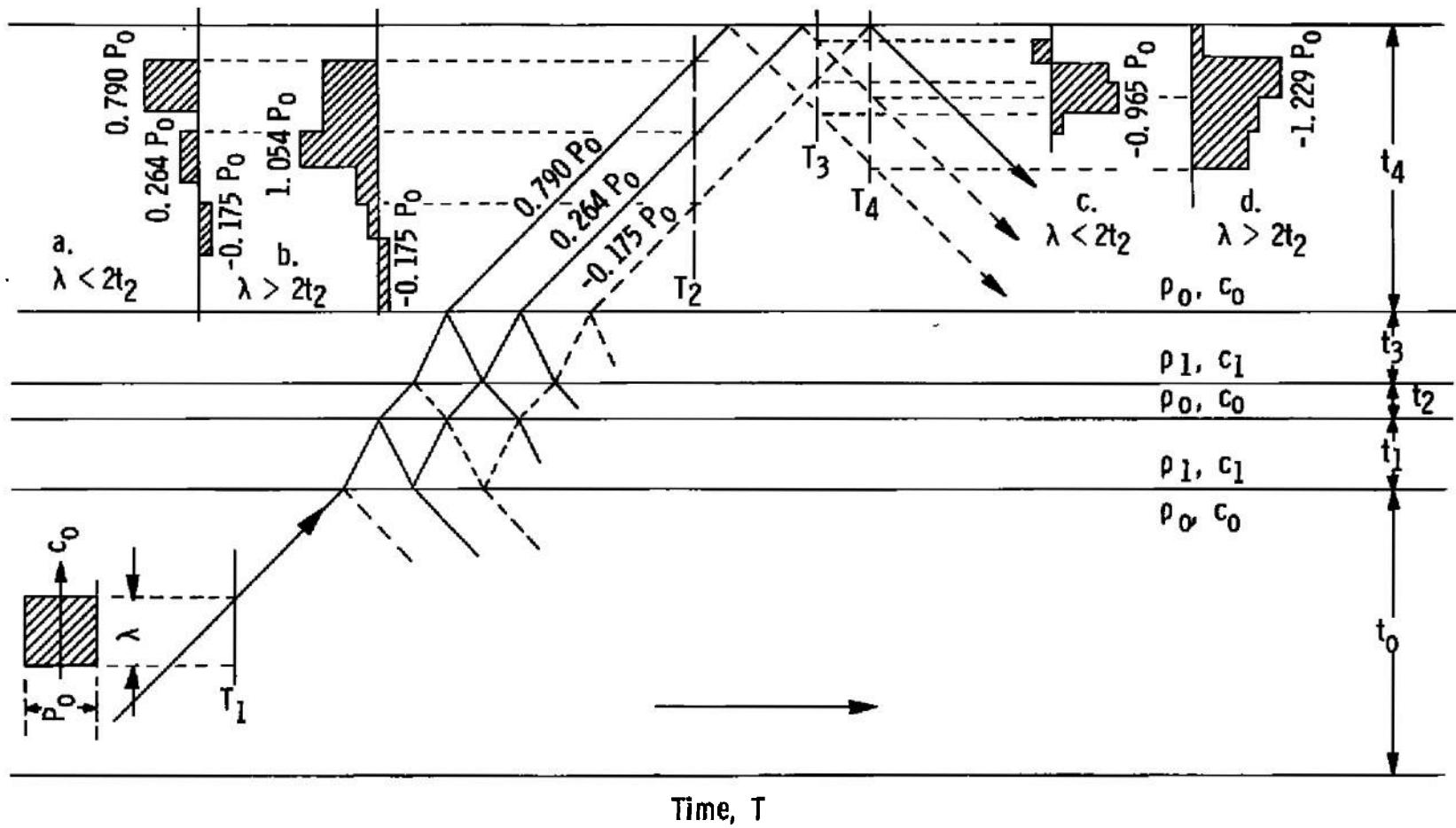
TABLE I

PROPERTIES OF SOME TYPICAL MATERIALS

	Density, ρ, lb-sec^2-ft^{-4}	Wave Velocity, c, ft-sec^{-1}	Characteristic Impedance, ρc, lb-sec-ft^{-3}
Steel	15.2	19,500	29.6 x 10^4
Silver	20.4	13,400	27.3 x 10^4
Copper	17.2	14,000	24.1 x 10^4
Lead	22.0	7,100	15.6 x 10^4
Mercury	26.3	4,500	11.8 x 10^4
Glass	5.0	22,300	11.15 x 10^4
Aluminum	5.22	20,900	10.9 x 10^4
Lucite	2.3	8,700	2.0 x 10^4
Water	1.94	5,200	1.01 x 10^4

TABLE II
IMPEDANCE MISMATCH FOR VARIOUS COMBINATIONS OF MATERIALS,

$$\text{IMPEDANCE MISMATCH, } K = \left(\frac{\rho_t \, c_t}{\rho_o \, c_o} \right)$$

1st ↓ \ 2nd →	Steel	Silver	Copper	Lead	Mercury	Glass	Aluminum	Lucite	Water
Steel	–	0.92	0.81	0.53	0.40	0.38	0.37	0.068	0.034
Silver	1.08	–	0.88	0.57	0.43	0.41	0.40	0.073	0.037
Copper	1.23	1.13	–	0.65	0.49	0.46	0.45	0.083	0.042
Lead	1.90	1.75	1.54	–	0.76	0.71	0.70	0.128	0.065
Mercury	2.51	2.31	2.04	1.32	–	0.94	0.92	0.169	0.086
Glass	2.65	2.45	2.16	1.40	1.06	–	0.98	0.179	0.091
Aluminum	2.72	2.50	2.21	1.43	1.08	1.02	–	0.183	0.093
Lucite	14.8	13.65	12.0	7.80	5.90	5.57	5.45	–	0.51
Water	29.3	27.0	23.9	15.4	11.68	11.00	10.8	1.98	–

APPENDIX I
VALUES OF PULSE AMPLITUDES IN LAMINATED MATERIAL

NOTE: Use of the values presented in this appendix
must be undertaken with the recognition that
their derivation has been based upon the
assumptions set forth in Section II of the text.

Guide to the Use of the Appendix

Nth Interface

Nth Lamination

P

A

AA

B

C

BB

CC

D

E

DD

```
K =  +.10    N =  +1
                              P =  +.18181819
     AA =  +.27047334         A =  +.14876034
                              B =  +.12171300   BB =  +.22129636
     CC =  +.18106065         C =  +.09958236
                              D =  +.08147729   DD =  +.14814053
                              E =  +.06666324

K =  +.10    N =  +2
                              P =  +.33057853
     AA =  -.04917697         A =  -.27047234
                              B =  +.22129437   BB =  +.04023571
     CC =  -.03292012         C =  -.18106066
                              D =  +.14814054   DD =  +.02693465
                              E =  -.12120589

K =  +.10    N =  +3
                              P =  +.06010519
     AA =  +.08941268         A =  +.04917697
                              B =  +.04023570   BB =  +.07215583
     CC =  +.05985477         C =  +.02292012
                              D =  +.02693464   DD =  +.04897208
                              E =  +.02203743

K =  +.10    N =  +4
                              P =  +.10928217
     AA =  -.01625685         A =  -.08941268
                              B =  +.07315582   BB =  +.01320104
     CC =  -.01088268         C =  -.05985477
                              D =  +.04897208   DD =  +.00890401
                              E =  -.04006604

K =  +.10    N =  +5
                              P =  +.01966948
     AA =  +.02955791         A =  +.01625685
                              B =  +.01330106   BB =  +.02418274
     CC =  +.01978670         C =  +.01066268
                              D =  +.00890401   DD =  +.01618911
                              E =  +.00728510
```

```
K =  +.10    N =  +6
                              P =  +.03612633
     AA =  -.00537416         A =  -.02955790
                              B =  +.02418274   BB =  +.00439704
     CC =  -.00359758         C =  -.01978669
                              D =  +.01618911   DD =  +.00294347
                              E =  -.01324564

K =  +.10    N =  +7
                              P =  +.00656842
     AA =  +.00977121         A =  +.00537416
                              B =  +.00439704   BB =  +.00799462
     CC =  +.00654105         C =  +.00359758
                              D =  +.00294247   DD =  +.00535177
                              E =  +.00240829

K =  +.10    N =  +8
                              P =  +.01194259
     AA =  -.00177698         A =  -.00977121
                              B =  +.00799462   BB =  +.00145356
     CC =  -.00118928         C =  -.00654105
                              D =  +.00535177   DD =  +.00097305
                              E =  -.00437872

K =  +.10    N =  +9
                              P =  +.00217138
     AA =  +.00322015         A =  +.00177658
                              B =  +.00145256   BB =  +.00264285
     CC =  +.00216292         C =  +.00118928
                              D =  +.00097305   DD =  +.00176918
                              E =  +.00079613

K =  +.10    N =  +10
                              P =  +.00394796
     AA =  -.00058720         A =  -.00222015
                              B =  +.00264285   BB =  +.00048051
     CC =  -.00039315         C =  -.00216223
                              D =  +.00176918   DD =  +.00022166
                              E =  -.00144751
```

```
K =  +.10    N =  +11
                              P =  +.00071781
     AA =  +.00106781         A =  +.00058730
                              B =  +.00046051   BB =  +.00087367
     CC =  +.00071482         C =  +.00039315
                              D =  +.00032166   DD =  +.00058485
                              E =  +.00026918

K =  +.10    N =  +12
                              P =  +.00120511
     AA =  -.00019414         A =  -.00106781
                              B =  +.00087567   BB =  +.00015684
     CC =  -.00012996         C =  -.00071482
                              D =  +.00058485   DD =  +.00010622
                              E =  -.00047851

K =  +.10    N =  +13
                              P =  +.00022729
     AA =  +.00025299         A =  +.00019414
                              B =  +.00015884   BB =  +.00028881
     CC =  +.00022650         C =  +.00012996
                              D =  +.00010632   DD =  +.00019334
                              E =  +.00008700

K =  +.10    N =  +14
                              P =  +.00043144
     AA =  -.00006418         A =  -.00035299
                              B =  +.00028881   BB =  +.00005251
     CC =  -.00004296         C =  -.00023630
                              D =  +.00019334   DD =  +.00003515
                              E =  -.00015818

K =  +.10    N =  +15
                              P =  +.00007844
     AA =  +.00011669         A =  +.00006418
                              B =  +.00005251   BB =  +.00009547
     CC =  +.00007811         C =  +.00004296
                              D =  +.00003515   DD =  +.00006391
                              E =  +.00002876
```

```
K =  +.10    N = +16                         K =  +.10    N = +21                         K =  +.10    N = +26

                    P =  +.00014262                             P =  +.00000283                             P =  +.00000056
  AA =  -.00002121  A =  -.00011669            AA =  +.00000421  A =  +.00000231            AA =  -.00000008  A =  -.00000046
                    B =  +.00009547  BB =  +.00001735            B =  +.00000189  BB =  +.00000344            B =  +.00000037  BB =  +.00000006
  CC =  -.00001420  C =  -.00007811            CC =  +.00000282  C =  +.00000155            CC =  -.00000005  C =  -.00000030
                    0 =  +.00006391  DD =  +.00001162            0 =  +.00000126  00 =  +.00000230            0 =  +.00000025  00 =  +.00000004
                    E =  -.00005229                             E =  +.00000103                             E =  -.00000020


K =  +.10    N = +17                         K =  +.10    N = +22                         K =  +.10    N = +27

                    P =  +.00002593                             P =  +.00000515                             P =  +.00000010
  AA =  +.00003857  A =  -.00002121            AA =  -.00000076  A =  -.00000421            AA =  +.00000015  A =  +.00000008
                    B =  +.00001735  BB =  +.00003156            B =  -.00000344  BB =  +.00000062            B =  +.00000006  BB =  +.00000012
  CC =  +.00002982  C =  +.00001420            CC =  -.00000051  C =  -.00000283            CC =  +.00000010  C =  +.00000005
                    0 =  +.00001162  00 =  +.00002112            0 =  +.00000230  00 =  +.00000041            0 =  +.00000004  00 =  +.00000008
                    E =  +.00000950                             E =  -.00000188                             E =  +.00000003


K =  +.10    N = +18                         K =  +.10    N = +23                         K =  +.10    N = +28

                    P =  +.00004714                             P =  +.00000093                             P =  +.00000018
  AA =  -.00000701  A =  -.00003857            AA =  +.00000139  A =  +.00000076            AA =  -.00000002  A =  -.00000015
                    B =  +.00003156  BB =  +.00000573            B =  +.00000062  BB =  +.00000114            B =  +.00000012  BB =  +.00000002
  CC =  -.00000469  C =  -.00002582            CC =  +.00000093  C =  +.00000051            CC =  -.00000001  C =  -.00000010
                    D =  +.00002112  00 =  +.00000584            0 =  +.00000041  DD =  +.00000076            0 =  +.00000008  DD =  +.00000001
                    E =  -.00001728                             E =  +.00000034                             E =  -.00000006


K =  +.10    N = +19                         K =  +.10    N = +24                         K =  -.10    N = +29

                    P =  +.00000857                             P =  +.00000170                             P =  +.00000003
  AA =  +.00001275  A =  +.00000701            AA =  -.00000025  A =  -.00000139            AA =  +.00000005  A =  +.00000002
                    B =  +.00000573  B0 =  +.00001043            B =  -.00000114  BB =  +.00000020            B =  +.00000002  BB =  +.00000004
  CC =  +.00000853  C =  +.00000469            CC =  -.00000016  C =  -.00000093            CC =  +.00000005  C =  +.00000001
                    0 =  +.00000584  00 =  +.00000698            D =  +.00000076  00 =  +.00000013            0 =  +.00000001  DD =  +.00000002
                    E =  +.00000314                             E =  -.00000062                             E =  +.00000001


K =  +.10    N = +20                         K =  +.10    N = +25                         K =  +.10    N = +30

                    P =  +.00001558                             P =  +.00000030                             P =  +.00000006
  AA =  -.00000231  A =  -.00001275            AA =  +.00000046  A =  +.00000025            AA =  -.00000000  A =  -.00000005
                    B =  +.00001043  BB =  +.00000189            B =  +.00000020  BB =  +.00000037            B =  +.00000004  BB =  +.00000000
  CC =  -.00000155  C =  -.00000853            CC =  +.00000030  C =  +.00000016            CC =  -.00000000  C =  -.00000003
                    0 =  +.00000698  DD =  +.00000126            D =  +.00000013  00 =  +.00000025            0 =  +.00000002  00 =  +.00000000
                    E =  -.00000571                             E =  +.00000011                             E =  -.00000002
```

K =   +.20   N = +1

AA = +.57057035
CC = +.16460905

P = +.53555350
A = +.22222220
B = +.14814815   BB = +.24691355
C = +.09876542
D = +.06584561   DD = +.10975935
E = +.04369574

K =   +.20   N = +2

AA = -.12345678
CC = +.05486968

P = +.55555552
A = -.37037054
B = +.24691356   BB = +.08230452
C = -.16460904
D = +.10975956   D = +.03697979
E = -.07515957

K =   +.20   N = +3

AA = +.20576128
CC = +.09144945

P = +.18516515
A = +.12345677
B = +.08230451   BB = +.13717418
C = +.05486967
D = +.03657970   00 = +.06096690
E = +.02458652

K =   +.20   N = +4

AA = -.06858709
CC = -.09048315

P = +.30864192
A = -.20576128
B = +.13717419   BB = +.04572474
C = -.09144945
D = +.06096630   00 = +.02032210
E = -.04064420

K =   +.20   N = +5

AA = +.11451182
CC = +.09080529

P = +.10288064
A = +.06656709
B = +.04572472   BB = +.07620788
C = +.03046315
D = +.02052210   00 = +.03587016
E = +.01394606

K =   +.20   N = +6

AA = -.05810394
CC = -.01699590P

P = +.17146772
A = -.11451181
B = +.07620787   BB = +.02540262
C = -.05080924
D = +.03587016   DD = +.01129005
E = -.02258011

K =   +.20   N = +7

AA = +.06550636
CC = +.02822514

P = +.05715540
A = -.05810399
B = +.02540262   BB = +.04233771
C = -.01699508
D = -.01129005   DD = +.01681675
E = +.00752670

K =   +.20   N = +8

AA = -.02116865
CC = -.00940837

P = +.09525985
A = -.06550655
B = +.04233770   BB = +.01411256
C = -.02822513
D = +.01881675   DD = +.00627225
E = -.01254450

K =   +.20   N = +9

AA = +.05520142
CC = +.01368063

P = +.05175927
A = +.02116885
B = +.01411256   BB = +.02392094
C = +.00940837
D = +.00627225   DD = +.01043375
E = +.00418150

K =   +.20   N = +10

AA = -.01176047
CC = -.00522687

P = +.05292213
A = -.05926142
B = +.02352094   BB = +.00784031
C = -.01966065
D = +.01043375   DD = +.00348458
E = -.00696916

K =   +.20   N = +11

AA = +.01960078
CC = +.00d71146

P = +.01764071
A = +.01176047
B = +.00784031   BB = +.01306719
C = +.00522687
D = +.00348458   DD = +.00560764
E = +.00232305

K =   +.20   N = +12

AA = -.00655359
CC = -.00290382

P = +.02940118
A = -.01960078
B = +.01506719   BB = +.00455573
C = -.00871146
D = +.00560764   00 = +.00195568
E = -.00567176

K =   +.20   N = +13

AA = +.01068932
CC = +.00463970

P = +.00980039
A = +.00693359
B = +.00455573   BB = +.00725955
C = +.00290562
D = +.00195586   00 = +.00322646
E = +.00129058

K =   +.20   N = +14

AA = -.00362977
CC = -.00161523

P = +.01635999
A = -.01088932
B = +.00725955   BB = +.00241965
C = -.00463970
D = +.00322646   DD = +.00107548
E = -.00215097

K =   +.20   N = +15

AA = +.00604982
CC = +.00268872

P = +.00544466
A = +.00362977
B = +.00241965   BB = +.00405508
C = +.00161323
D = +.00107546   DD = +.00179246
E = +.00071699

```
K = +.20    N = +16

                        P =  +.00907443
AA = -.00201654         A =  -.00604962
                        B =  +.00403308    BB =  +.00134438
CC = -.00089624         C =  -.00268872
                        D =  +.00179248    DD =  +.00059749
                        E =  -.00119498


K = +.20    N = +17

                        P =  +.00302481
AA = +.00336090         A =  +.00201654
                        B =  +.00134438    BB =  +.00224060
CC = +.00149373         C =  +.00089624
                        D =  +.00059749    DD =  -.00099582
                        E =  +.00039832


K = +.20    N = +18

                        P =  +.00504135
AA = -.00112030         A =  -.00338090
                        B =  +.00224060    BB =  +.00074686
CC = -.00049791         C =  -.00149373
                        D =  +.00099582    DD =  +.00033194
                        E =  -.00066388


K = +.20    N = +19

                        P =  +.00168045
AA = +.00186718         A =  +.00112030
                        B =  +.00074888    BB =  +.00124477
CC = +.00082985         C =  +.00049791
                        D =  +.00033194    DD =  +.00055323
                        E =  +.00022129


K = +.20    N = +20

                        P =  +.00280075
AA = -.00062258         A =  -.00188716
                        B =  +.00124477    BB =  +.00041492
CC = -.00027661         C =  -.00082985
                        D =  +.00055323    DD =  +.00018441
                        E =  -.00036882
```

```
K = +.20    N = +21

                        P =  +.00093358
AA = +.00103731         A =  +.00062238
                        B =  +.00041492    BB =  +.00069154
CC = +.00046102         C =  +.00027661
                        D =  +.00018441    DD =  +.00030735
                        E =  +.00012294


K = +.20    N = +22

                        P =  +.00155597
AA = -.00034577         A =  -.00103731
                        B =  +.00069154    BB =  +.00023051
CC = -.00015367         C =  -.00046102
                        D =  +.00030735    DD =  +.00010245
                        E =  -.00020490


K = +.20    N = +23

                        P =  +.00051865
AA = +.00057628         A =  +.00034577
                        B =  +.00023091    BB =  +.00038419
CC = +.00025812         C =  +.00015387
                        D =  +.00010245    DD =  +.00017075
                        E =  +.00006830


K = +.20    N = +24

                        P =  +.00086442
AA = -.00019209         A =  -.00057628
                        B =  +.00038419    BB =  +.00012806
CC = -.00008537         C =  -.00025612
                        D =  +.00017075    DD =  +.00005691
                        E =  -.00011383


K = +.20    N = +25

                        P =  +.00028814
AA = +.00032019         A =  +.00019209
                        B =  +.00012806    BB =  +.00021343
CC = +.00014229         C =  +.00008537
                        D =  +.00005691    DD =  +.00009480
                        E =  +.00003794
```

```
K = +.20    N = +26

                        P =  +.00048023
AA = -.00010671         A =  -.00032019
                        B =  +.00021343    BB =  +.00007114
CC = -.00004743         C =  -.00014229
                        D =  +.00009486    DD =  +.00003162
                        E =  -.00006324


K = +.20    N = +27

                        P =  +.00016007
AA = +.00017786         A =  +.00010671
                        B =  +.00007114    BB =  +.00011857
CC = +.00007905         C =  +.00004743
                        D =  +.00003182    DD =  +.00005270
                        E =  +.00002108


K = +.20    N = +28

                        P =  +.00026679
AA = -.00005928         A =  -.00017786
                        B =  +.00011857    BB =  +.00003952
CC = -.00002635         C =  -.00007905
                        D =  +.00005270    DD =  +.00001756
                        E =  -.00003513


K = +.20    N = +29

                        P =  +.00008893
AA = +.00009881         A =  +.00005928
                        B =  +.00003952    BB =  +.00006587
CC = +.00004391         C =  +.00002635
                        D =  +.00001756    DD =  +.00002927
                        E =  +.00001171


K = +.20    N = +30

                        P =  +.00014822
AA = -.00003293         A =  -.00009881
                        B =  +.00006587    BB =  +.00002195
CC = -.00001463         C =  -.00004391
                        D =  +.00002927    DD =  +.00000975
                        E =  -.00001951
```

```
K = +.30   N = +1                 K = +.30   N = +6                 K = +.30   N = +11
                  P = +.48153844                    P = +.35800040                    P = +.08330680
  AA = +.30233992 A = +.24852069     AA = -.08897051 A = -.19276944     AA = +.06901155 A = +.04485751
                  B = +.13381883                    B = +.10379899                    B = +.02415404
  CC = +.11085583 BB = +.20587512    CC = -.02579618 BB = +.04790720    CC = +.02000928 BB = +.03716006
                  C = +.07205629                    C = -.05589173                    C = +.01300602
                  D = +.03879954                    D = +.03009554                    D = +.00700324
                  DD = +.05969160                   DD = +.01389025                   DD = +.01077422
                  E = +.02089206                    E = -.01620529                    E = +.00377097

K = +.30   N = +2                 K = +.30   N = +7                 K = +.30   N = +12
                  P = +.71005913                    P = +.16523096                    P = +.12816432
  AA = -.17646440 A = -.38233993     AA = +.13887771 A = +.08897051     AA = -.03185148 A = -.06901155
                  B = +.20587513                    B = +.04790720                    B = +.03716006
  CC = -.05116424 BB = +.09501929    CC = +.03968643 BB = +.07370338    CC = -.00923504 BB = +.01715080
                  C = -.11085584                    C = +.02579618                    C = -.02000926
                  D = +.05969160                    D = +.01589025                    D = +.01077422
                  DD = +.02754997                   DD = +.02136961                   DD = +.00497271
                  E = -.03214163                    E = +.00747938                    E = -.00580150

K = +.30   N = +3                 K = +.30   N = +8                 K = +.30   N = +13
                  P = +.32771962                    P = +.25420148                    P = +.05915279
  AA = +.27146370 A = +.17646441     AA = -.06317434 A = -.13887772     AA = +.04900228 A = +.03185148
                  B = +.09501929                    B = +.07370338                    B = +.01715079
  CC = +.07871620 BB = +.14618353    CC = -.01831681 BB = +.03401694    CC = +.01420776 BB = +.02638584
                  C = +.05116423                    C = -.03968643                    C = +.00923504
                  D = +.02754997                    D = +.02138962                    D = +.00497271
                  DD = +.04238457                   DD = +.00986290                   DD = +.00785033
                  E = +.01483460                    E = -.01150671                    E = +.00267761

K = +.30   N = +4                 K = +.30   N = +9                 K = +.30   N = +14
                  P = +.50418404                    P = +.11752376                    P = +.09100424
  AA = -.12530016 A = -.27146371     AA = +.09719127 A = +.06317433     AA = -.02261843 A = -.04900228
                  B = +.14618353                    B = +.03401694                    B = +.02638584
  CC = -.03632963 BB = +.08746992    CC = +.02817971 BB = +.05233376    CC = -.00655743 BB = +.01217808
                  C = -.07871421                    C = +.01831681                    C = -.01420776
                  D = +.04238457                    D = +.00986290                    D = +.00765033
                  DD = +.01956211                   DD = +.01517369                   DD = +.00353092
                  E = -.02282246                    E = +.00531079                    E = -.00411941

K = +.30   N = +5                 K = +.30   N = +10                K = +.30   N = +15
                  P = +.23270050                    P = +.18049809                    P = +.04200196
  AA = +.19276947 A = +.12530016     AA = -.04485751 A = -.09719127     AA = +.03474652 A = +.02261644
                  B = +.08746931                    B = +.05233376                    B = +.01217808
  CC = +.05589174 BB = +.10379894    CC = -.01300602 BB = +.02415404    CC = +.01008835 BB = +.01873551
                  C = +.03632963                    C = -.02817971                    C = +.00655742
                  D = +.01956210                    D = +.01517369                    D = +.00353092
                  DD = +.03009555                   DD = +.00700324                   DD = +.00543218
                  E = +.01053344                    E = -.00817045                    E = +.00190126
```

K = +.30   N = +16

AA = -.01605900
CC = -.00465616

P = +.06461839
A = -.03479451
B = +.01873551   BB = +.00864715
C = -.01008835
D = +.00543218   DD = +.00250716
E = -.00292502

K = +.30   N = +17

AA = +.02470516
CC = +.00716332

P = +.02982387
A = +.01605901
B = +.00864715   BB = +.01330332
C = +.00465616
D = +.00250716   DD = +.00385717
E = +.00135001

K = +.30   N = +18

AA = -.01140284
CC = -.00330615

P = +.04588288
A = -.02470617
B = +.01330332   BB = +.00613999
C = -.00716332
D = +.00385717   DD = +.00178023
E = -.00207694

K = +.30   N = +19

AA = +.01754284
CC = +.00508638

P = +.02117671
A = +.01140284
B = +.00613999   BB = +.00944614
C = +.00330615
D = +.00178023   DD = +.00273882
E = +.00095858

K = +.30   N = +20

AA = -.00809669
CC = -.00234756

P = +.03257956
A = -.01754284
B = +.00944614   BB = +.00435975
C = -.00508638
D = +.00273882   DD = +.00126407
E = -.00147475

K = +.30   N = +21

AA = +.01245649
CC = +.00361163

P = +.01505671
A = +.00809669
B = +.00435975   BB = +.00670731
C = +.00234756
D = +.00126407   DD = +.00194472
E = +.00068065

K = +.30   N = +22

AA = -.00574913
CC = -.00166690

P = +.02313340
A = -.01245645
B = +.00670731   BB = +.00309568
C = -.00361163
D = +.00194472   DD = +.00089756
E = -.00104716

K = +.30   N = +23

AA = +.00884481
CC = +.00256447

P = +.01067695
A = +.00574913
B = +.00309568   BB = +.00476259
C = +.00166690
D = +.00089756   DD = +.00138087
E = +.00048330

K = +.30   N = +24

AA = -.00408222
CC = -.00118360

P = +.01642607
A = -.00884481
B = +.00476259   BB = +.00219811
C = -.00256447
D = +.00138086   DD = +.00063732
E = -.00074354

K = +.30   N = +25

AA = +.00628034
CC = +.00182092

P = +.00758127
A = +.00408222
B = +.00219812   BB = +.00338172
C = +.00118360
D = +.00063732   DD = +.00098049
E = +.00034317

K = +.30   N = +26

AA = -.00289862
CC = -.00084042

P = +.01166349
A = -.00628034
B = +.00338172   BB = +.00156079
C = -.00182092
D = +.00098049   DD = +.00045253
E = -.00052796

K = +.30   N = +27

AA = +.00445941
CC = +.00129296

P = +.00538315
A = +.00289862
B = +.00156079   BB = +.00240122
C = +.00084042
D = +.00045253   DD = +.00069621
E = +.00024367

K = +.30   N = +28

AA = -.00205819
CC = -.00059675

P = +.00828177
A = -.00445941
B = +.00240122   BB = +.00110825
C = -.00129296
D = +.00069621   DD = +.00032132
E = -.00037488

K = +.30   N = +29

AA = +.00316644
CC = +.00091808

P = +.00382235
A = +.00205819
B = +.00110825   BB = +.00170501
C = +.00059675
D = +.00032132   DD = +.00049435
E = +.00017302

K = +.30   N = +30

AA = -.00146143
CC = -.00042373

P = +.00588054
A = -.00316644
B = +.00170501   BB = +.00078692
C = -.00091808
D = +.00049435   DD = +.00022816
E = -.00026618

```
K = +.40   N = +1                              K = +.40   N = +6                              K = +.40   N = +11

                   P = +.57142853                                 P = +.54599096                                 P = +.20714830
AA = +.34985420    A = +.24489794              AA = -.13522228    A = -.23315895              AA = +.12682548    A = +.00877784
                   B = +.10495626  BB = +.14993751                B = +.09991670  BB = +.05709525                B = +.03804764  BB = +.05435577
CC = +.06425893    C = +.04498125              CC = -.02446939    C = -.04282144              CC = +.02329447    C = +.01650615
                   D = +.01927767  DD = +.02753954                D = +.01835204  DD = +.01048688                D = +.00698834  DD = +.00998334
                   E = +.00826186                                 E = -.00786516                                 E = +.00299500


K = +.40   N = +2                              K = +.40   N = +7                              K = +.40   N = +12

                   P = +.81632650                                 P = +.51085195                                 P = +.29592615
AA = -.19991670    A = -.34985421              AA = +.19031751    A = +.13522226              AA = -.07247171    A = -.12682548
                   B = +.14993751  BB = +.08567858                B = +.05709525  BB = +.08156464                B = +.05435377  BB = +.03305930
CC = -.03671939    C = -.06425893              CC = +.03495627    C = +.02446939              CC = -.01991112    C = -.02329447
                   D = +.02753954  DD = +.01573688                D = +.01048688  DD = +.01498126                D = +.00998334  DD = +.00570476
                   E = -.01180266                                 E = +.00449437                                 E = -.00427857


K = +.40   N = +3                              K = +.40   N = +8                              K = +.40   N = +13

                   P = +.46647224                                 P = +.44407423                                 P = +.16910066
AA = +.28959524    A = +.19991687              AA = -.10875217    A = -.19031752              AA = +.10355101    A = +.07247171
                   B = +.08567857  BB = +.12239795                B = +.08156465  BB = +.04660837                B = +.05105930  BB = +.04437043
CC = +.05245626    C = +.03671938              CC = -.01997501    C = -.03495627              CC = +.01901589    C = +.01331113
                   D = +.01573688  DD = +.02248125                D = +.01498126  DD = +.00856072                D = +.00570476  DD = +.00814967
                   E = +.00674437                                 E = -.00642054                                 E = +.00244490


K = +.40   N = +4                              K = +.40   N = +9                              K = +.40   N = +14

                   P = +.66638890                                 P = +.25575667                                 P = +.24157259
AA = -.16319729    A = -.28959524              AA = +.15536122    A = +.10875286              AA = -.05916059    A = -.10355101
                   B = +.12239795  BB = +.06994169                B = +.04660836  BB = +.06658338                B = +.04437042  BB = +.02533453
CC = -.02997501    C = -.05245626              CC = +.02855573    C = +.01997501              CC = -.01086622    C = -.01901589
                   D = +.02248125  DD = +.01284645                D = +.00856071  DD = +.01222959                D = +.00814967  DD = +.00465695
                   E = -.00963482                                 E = +.00366887                                 E = -.00349271


K = +.40   N = +5                              K = +.40   N = +10                             K = +.40   N = +15

                   P = +.38079969                                 P = +.56250950                                 P = +.15804135
AA = +.23513898    A = +.16319729              AA = -.08877784    A = -.15536121              AA = +.08451510    A = +.05916057
                   B = +.06994165  BB = +.09991670                B = +.06658337  BB = +.03804764                B = +.02533453  BB = +.03622076
CC = +.04282144    C = +.02997501              CC = -.01650613    C = -.02855573              CC = +.01552318    C = +.01086622
                   D = +.01284643  DD = +.01835204                D = +.01222959  DD = +.00698834                D = +.00465695  DD = +.00665279
                   E = +.00550581                                 E = -.00524125                                 E = +.00199583
```

```
K = +.40   N = +16                          K = +.40   N = +21                          K = +.40   N = +26
                  P = +.19720192                             P = +.07509324                              P = +.07148760
AA = -.04829434   A = -.08451510            AA = +.04597545  A = +.03218281             AA = -.01750717   A = -.03063754
                  B = +.03622075  BB = +.02069757            B = +.01379263  BB = +.01970376              B = +.01313037  BB = +.00750307
CC = -.00887039   C = -.01552318            CC = +.00844447  C = +.00591112             CC = -.00321560   C = -.00562730
                  D = +.00665279  DD = +.00380159            D = +.00253334  DD = +.00361905              D = +.00241170  DD = +.00137811
                  E = -.00285119                             E = +.00208571                               E = -.00103598

K = +.40   N = +17                          K = +.40   N = +22                          K = +.40   N = +27
                  P = +.11268680                             P = +.10727606                              P = +.04085005
AA = +.06899191   A = +.04829434            AA = -.02627168  A = -.04597545             AA = +.02501023   A = +.01750716
                  B = +.02069757  BB = +.02956796            B = +.01970376  BB = +.01125929              B = +.00750307  BB = +.01071867
CC = +.01267198   C = +.00887038            CC = -.00482541  C = -.00844447             CC = +.00459371   C = +.00321560
                  D = +.00380159  DD = +.00543085            D = +.00361905  DD = +.00206803              D = +.00137811  DD = +.00196873
                  E = +.00162925                             E = -.00155102                               E = +.00059062

K = +.40   N = +18                          K = +.40   N = +23                          K = +.40   N = +28
                  P = +.16098119                             P = +.06130058                              P = +.05835721
AA = -.03942395   A = -.06899192            AA = +.03753097  A = +.02627166             AA = -.01429156   A = -.02501023
                  B = +.02956796  BB = +.01689598            B = +.01125929  BB = +.01608470              B = +.01071867  BB = +.00612495
CC = -.00724113   C = -.01267198            CC = +.00689344  C = +.00482541             CC = -.00262498   C = -.00459371
                  D = +.00543085  DD = +.00310334            D = +.00206803  DD = +.00295433              D = +.00196873  DD = +.00112499
                  E = -.00292750                             E = +.00088629                               E = -.00084374

K = +.40   N = +19                          K = +.40   N = +24                          K = +.40   N = +29
                  P = +.09198922                             P = +.08757226                              P = +.03334698
AA = +.05631993   A = +.03942395            AA = -.02144626  A = -.03753097             AA = +.02041651   A = +.01429156
                  B = +.01689597  BB = +.02413711            B = +.01608470  BB = +.00919125              B = +.00612495  BB = +.00874993
CC = +.01034447   C = +.00724113            CC = -.00393911  C = -.00689344             CC = +.00374997   C = +.00262498
                  D = +.00310334  DD = +.00443334            D = +.00295433  DD = +.00168819              D = +.00112499  DD = +.00160713
                  E = +.00133000                             E = -.00126614                               E = +.00048213

K = +.40   N = +20                          K = +.40   N = +25                          K = +.40   N = +30
                  P = +.13141316                             P = +.05004193                              P = +.04763854
AA = -.03218281   A = -.05631992            AA = +.03063754  A = +.02144628             AA = -.01166858   A = -.02041652
                  B = +.02413711  BB = +.01379263            B = +.00919126  BB = +.01313037              B = +.00874993  BB = +.00499996
CC = -.00591112   C = -.01034447            CC = +.00562730  C = +.00393911             CC = -.00214284   C = -.00374997
                  D = +.00443334  DD = +.00253334            D = +.00168819  DD = +.00241170              D = +.00160713  DD = +.00091836
                  E = -.00190000                             E = +.00072351                               E = -.00068877
```

K = +.50   N = +1

AA = +.29629627   P = +.66666663
A = +.22222221
B = +.07407406   BB = +.09876542
CC = +.03292180   C = +.02469135
D = +.00823045   DD = +.01097395
E = +.00274348

K = +.50   N = +2

AA = -.19753086   P = +.88888884
A = -.29629628
B = +.09876542   BB = +.06584361
CC = -.02194787   C = -.03292180
D = +.01097393   DD = +.00731595
E = -.00365797

K = +.50   N = +3

AA = +.26337444   P = +.59259250
A = +.19753083
B = +.06584361   BB = +.08779148
CC = +.02926382   C = +.02194787
D = +.00751595   DD = +.00979460
E = +.00243865

K = +.50   N = +4

AA = -.17558296   P = +.79012934
A = -.26337444
B = +.08779148   BB = +.05852765
CC = -.01950921   C = -.02926382
D = +.00979460   DD = +.00650307
E = -.00325153

K = +.50   N = +5

AA = +.23411062   P = +.52674895
A = +.17558297
B = +.05852765   BB = +.07803687
CC = -.02601229   C = +.01950921
D = +.00650307   DD = +.00867076
E = +.00216769

K = +.50   N = +6

AA = -.15607374   P = +.70233185
A = -.23411061
B = +.07803687   BB = +.05202458
CC = -.01734152   C = -.02601229
D = +.00867076   DD = +.00578050
E = -.00289025

K = +.50   N = +7

AA = +.20809854   P = +.46822127
A = +.15607376
B = +.05202458   BB = +.06936611
CC = +.02312203   C = +.01734152
D = +.00578050   DD = +.00770754
E = +.00192683

K = +.50   N = +8

AA = -.13873223   P = +.62429499
A = -.20809853
B = +.06936610   BB = +.04624407
CC = -.01541469   C = -.02312203
D = +.00770754   DD = +.00513823
E = -.00256911

K = +.50   N = +9

AA = +.18497626   P = +.41619663
A = +.13873221
B = +.04624407   BB = +.06165876
CC = +.02055292   C = +.01541469
D = +.00513823   DD = +.00685097
E = +.00171274

K = +.50   N = +10

AA = -.12331752   P = +.55492881
A = -.18497627
B = +.06165875   BB = +.04110583
CC = -.01370194   C = -.02055291
D = +.00685097   DD = +.00456731
E = -.00228363

K = +.50   N = +11

AA = +.16442395   P = +.38995255
A = +.12331752
B = +.04110583   BB = +.05480778
CC = +.01826926   C = +.01370194
D = +.00456731   DD = +.00608975
E = +.00152243

K = +.50   N = +12

AA = -.10961556   P = +.49327003
A = -.16442334
B = -.05480778   BB = +.03653852
CC = -.01217950   C = -.01826926
D = +.00608975   DD = +.00405983
E = -.00202991

= +.50   N = +13

AA = +.14615409   P = +.32884670
A = +.10961557
B = +.03653852   BB = +.04871802
CC = +.01623934   C = +.01217950
D = +.00405983   DD = +.00541311
E = +.00135327

. = +.50   N = +14

AA = -.09743608   P = +.43846224
A = -.14615408
B = +.04871802   BB = +.03247868
CC = -.01082622   C = -.01623934
D = +.00541311   DD = +.00360874
F = -.00180457

K = +.50   N = +15

AA = +.12991474   P = +.29230819
A = +.09743606
B = +.03247868   BB = +.04330491
CC = +.01443497   C = +.01082622
D = +.00360874   DD = +.00481165
E = +.00120291

```
K = +.50    N = +16
                                P = +.38974423
    AA = -.08660983             A = -.12991474
                                B = +.04330491    BB = +.02886994
    CC = -.00962331             C = -.01443497
                                D = +.00481165    DD = +.00320177
                                E = -.00160388

K = +.50    N = +17
                                P = +.25982945
    AA = +.11547975             A = +.08660981
                                B = +.02886993    BB = +.03849325
    CC = +.01283108             C = +.00962331
                                D = +.00320777    DD = +.00427702
                                E = +.00106925

K = +.50    N = +18
                                P = +.34643926
    AA = -.07698650             A = -.11547975
                                B = +.05849325    BB = +.02566216
    CC = -.00855405             C = -.01283108
                                D = +.00427702    DD = +.00285135
                                E = -.00142567

K = +.50    N = +19
                                P = +.23095954
    AA = +.10264868             A = +.07698651
                                B = +.02566217    BB = +.03421622
    CC = +.01140540             C = +.00855405
                                D = +.00285135    DD = +.00380180
                                E = +.00095045

K = +.50    N = +20
                                P = +.30794602
    AA = -.06843245             A = -.10264867
                                B = +.03421622    BB = +.02281081
    CC = -.00760360             C = -.01140540
                                D = +.00380180    DD = +.00253493
                                E = -.00126726


=  +.50     N = +21
                                P = +.20529735
    AA = +.09124326             A = +.06843244
                                B = +.02281081    BB = +.03041447
    CC = +.01013814             C = +.00760360
                                D = +.00253453    DD = +.00337938
                                E = +.00084484

K = +.50    N = +22
                                P = +.27372978
    AA = -.06082885             A = -.09124325
                                B = +.03041442    BB = +.02027628
    CC = -.00675876             C = -.01013814
                                D = +.00337938    DD = +.00225292
                                E = -.00112646

K = +.50    N = +23
                                P = +.18248651
    AA = +.08110511             A = +.06082883
                                B = +.02027627    BB = +.02703503
    CC = +.00901167             C = +.00675875
                                D = +.00225291    DD = +.00300389
                                E = +.00075097

K = +.50    N = +24
                                P = +.24331533
    AA = -.05407007             A = -.08110510
                                B = +.02703503    BB = +.01802335
    CC = -.00600778             C = -.00901167
                                D = +.00300389    DD = +.00200259
                                E = -.00100129

K = +.50    N = +25
                                P = +.16221023
    AA = +.07209345             A = +.05407007
                                B = +.01802335    BB = +.02403114
    CC = +.00801038             C = +.00600778
                                D = +.00200259    00 = +.00267012
                                E = +.00066753


K = +.50    N = +26
                                P = +.21628028
    AA = -.04806228             A = -.07209342
                                B = +.02403114    BB = +.01602076
    CC = -.00534025             C = -.00801038
                                D = +.00267012    DD = +.00178008
                                E = -.00089004

K = +.50    N = +27
                                P = +.14418687
    AA = +.06408305             A = +.04806229
                                B = +.01602076    BB = +.02136101
    CC = +.00712033             C = +.00534025
                                D = +.00178008    DD = +.00237344
                                E = +.00059336

K = +.50    N = +28
                                P = +.19224915
    AA = -.04272203             A = -.06408304
                                B = +.02136101    BB = +.01424067
    CC = -.00474689             C = -.00712033
                                D = +.00237344    00 = +.00158229
                                E = -.00079114

K = +.50    N = +29
                                P = +.12816606
    AA = +.05696289             A = +.04272202
                                B = +.01424067    BB = +.01898756
    CC = +.00632918             C = +.00474689
                                D = +.00158229    00 = +.00210972
                                E = +.00052743

K = +.50    N = +30
                                P = +.17088807
    AA = -.03797512             A = -.05696268
                                B = +.01898756    BB = +.01265837
    CC = -.00421945             C = -.00632918
                                D = +.00210972    DD = +.00140648
                                E = -.00070324
```

K = +.60   N = +1

    AA = +.25437498   P = +.74999996
                        A = +.18749999
                        B = +.04687499   BB = +.05859374
    CC = +.01464843   C = +.01171874
                        D = +.00292960   DD = +.00366210
                        E = +.00073242

K = +.60   N = +2

    AA = -.17578123   P = +.93749997
                        A = -.23437499
                        B = +.05859374   BB = +.04394531
    CC = -.01098632   C = -.01464843
                        D = +.00366210   DD = +.00274658
                        E = -.00091532

K = +.60   N = +3

    AA = +.21972656   P = +.70512300
                        A = +.17578123
                        B = +.04594531   BB = +.03493164
    CC = +.01373291   C = +.01096632
                        D = +.00274658   DD = +.00343322
                        E = +.00068664

K = +.60   N = +4

    AA = -.16479493   P = +.87890628
                        A = -.21972657
                        B = +.05493164   BB = +.04119875
    CC = -.01029966   C = -.01373291
                        D = +.00343322   DD = +.00257492
                        E = -.00085830

K = +.60   N = +5

    AA = +.20599366   P = +.65917971
                        A = +.16479493
                        B = +.04119875   BB = +.05149841
    CC = +.01287460   C = +.01029968
                        D = +.00257492   DD = +.00321865
                        E = +.00066373

K = +.60   N = +6

    AA = -.15449324   P = +.82397460
                        A = -.20399363
                        B = +.03149641   BB = +.03862581
    CC = -.00963395   C = -.01287460
                        D = +.00321863   DD = +.00241398
                        E = -.00080466

K = +.60   N = +7

    AA = +.19511905   P = +.61798097
                        A = +.13449524
                        B = +.05862581   BB = +.04827976
    CC = +.01206994   C = -.00965393
                        D = +.00241398   DD = +.00301748
                        E = +.00060549

K = +.60   N = +8

    AA = -.14483926   P = +.77247617
                        A = -.19311904
                        B = +.04827976   BB = +.03620982
    CC = -.00905245   C = -.01206994
                        D = +.00301748   DD = +.00226511
                        E = -.00073437

K = +.60   N =

    AA = +.18104912   P = +.57935721
                        A = +.14483930
                        B = +.03620982   BB = +.04326228
    CC = +.01131557   C = +.00905243
                        D = +.00226311   DD = +.00282889
                        E = +.00036377

K = +.60   N = +10

    AA = -.13578684   P = +.72419648
                        A = -.18104912
                        B = +.04326228   BB = +.05394671
    CC = -.00848667   C = -.01151337
                        D = +.00282889   DD = +.00212166
                        E = -.00070722

K = +.60   N = +11

    AA = +.16973354   P = +.54314755
                        A = +.13578694
                        B = +.03394470   BB = +.04243336
    CC = +.0106D834   C = +.00848667
                        D = +.00212166   DD = +.00263208
                        E = +.B0033041

K = +.60   N = +12

    AA = -.12730016   P = +.67893414
                        A = -.16973334
                        B = +.04243539   BB = +.03182303
    CC = -.00795626   C = -.01060834
                        D = +.00265208   DD = +.00196906
                        E = -.00066302

K = +.60   N = +13

    AA = +.15912520   P = +.30920063
                        A = +.12730016
                        B = +.03182304   BB = +.03978130
    CC = +.00994532   C = +.00795626
                        D = +.00198906   DD = +.00248633
                        E = +.00049726

K = +.60   N = +14

    AA = -.11934390   P = +.63630077
                        A = -.13912319
                        B = +.03978129   BB = +.02983597
    CC = -.00745899   C = -.00994332
                        D = +.0024 635   DD = +.00186474
                        E = -.00062158

K = +.60   N = +15

    AA = +.14917986   P = +.47757337
                        A = +.11934389
                        B = +.02983597   BB = +.03729496
    CC = +.00932374   C = +.00743899
                        D = +.00186474   DD = +.00253093
                        E = +.00046618

K = +.60   N = +16

AA = -.11188490   P = +.59671944
                       A = -.14917906
CC = -.00699280   0 = +.03729696   BB = +.02797122
                       C = -.00992374
                       0 = +.00233093   00 = +.00174820
                       E = -.00058273

K = +.60   N = +17

AA = +.13985612   P = +.44753961
                       A = +.11188490
CC = +.00874100   B = +.02797122   dB = +.03496403
                       C = +.00699280
                       D = +.00174820   00 = +.00218525
                       E = +.00043705

K = +.60   N = +18

AA = -.10489209   P = +.55942448
                       A = -.13985612
CC = -.00655575   B = +.03496403   BB = +.02622302
                       C = -.00874100
                       D = +.00218525   DD = +.00163893
                       E = -.00054631

K = +.60   N = +19

AA = +.13111913   P = +.41956842
                       A = +.10489211
CC = +.00819469   B = +.02622302   BB = +.03277878
                       C = +.00655575
                       D = +.00163893   00 = +.00204867
                       E = +.00040973

K = +.60   N = +20

AA = -.09833635   P = +.52446050
                       A = -.13111513
CC = -.00614602   B = +.03277878   BB = +.02458408
                       C = -.00819469
                       D = +.00204867   00 = +.00153650
                       E = -.00051216

K = +.60   N = +21

AA = +.12292042   P = +.39334556
                       A = +.09833634
CC = +.00768252   B = +.02458408   BB = +.03073010
                       C = +.00614602
                       0 = +.00153650   00 = +.00192063
                       E = +.00038412

K = +.60   N = +22

AA = -.09219032   P = +.49168169
                       A = -.12292042
CC = -.00576189   B = +.03073010   BB = +.02304758
                       C = -.00768252
                       0 = +.00192063   OD = +.00144047
                       E = -.00048015

K = +.60   N = +23

AA = +.11523790   P = +.36876128
                       A = +.09219032
CC = +.00720236   B = +.02304758   BB = +.02880947
                       C = +.00576189
                       0 = +.00144047   DD = +.00180059
                       E = +.00036011

K = +.60   N = +24

AA = -.08642843   P = +.46095159
                       A = -.11523790
CC = -.00540177   B = +.02880947   BB = +.02160710
                       C = -.00720236
                       0 = +.00180059   OD = +.00135044
                       E = -.00045014

K = +.60   N = +25

AA = +.10803552   P = +.34571368
                       A = +.08642842
CC = +.00675222   B = +.02160710   BB = +.02700888
                       C = +.00540177
                       D = +.00135044   DD = +.00168805
                       E = +.00033761

K = +.60   N = +26

AA = -.08102664   P = +.43214208
                       A = -.10803552
CC = -.00506416   B = +.02700888   BB = +.02025666
                       C = -.00675222
                       0 = +.00168805   DD = +.00126604
                       E = -.00042201

K = +.60   N = +27

AA = +.10128331   P = +.32410660
                       A = -.08102665
CC = +.00633020   B = +.02025666   BB = +.02532082
                       C = -.00506416
                       D = +.00126604   00 = +.00158255
                       E = +.00031651

K = +.60   N = +28

AA = -.07596249   P = +.40513323
                       A = -.10128531
CC = -.00474765   B = +.02532082   BB = +.01899062
                       C = -.00633020
                       0 = +.00158255   DD = +.00118691
                       E = -.00039563

K = +.60   N = +29

AA = +.09495311   P = +.30304995
                       A = +.07596248
CC = +.00593456   B = +.01899062   BB = +.02373827
                       C = +.00474765
                       0 = +.00118691   DD = +.00148364
                       E = +.00029672

K = +.60   N = +30

AA = -.07121482   P = +.37981241
                       A = -.09495310
CC = -.00445092   B = +.02373827   BB = +.01780370
                       C = -.00593456
                       0 = +.00148364   00 = +.00111273
                       E = -.00037091

```
K =  +.70    N =  +1
                          P =  +.82552929
    AA =  +.17097492      A =  +.14532869
                          B =  +.02564623      BB =  +.03017204
    CC =  +.00532447      C =  +.00452580
                          D =  +.00079867      DD =  +.00093961
                          E =  +.00014094


K =  +.70    N =  +2
                          P =  +.96885797
    AA =  -.14080289      A =  -.17097493
                          B =  +.03017204      BB =  +.02484756
    CC =  -.00458486      C =  -.00532447
                          D =  +.00093961      DD =  +.00077579
                          E =  -.00016581


K =  +.70    N =  +3
                          P =  +.79788297
    AA =  +.16565045      A =  -.14080287
                          B =  +.02484756      BB =  +.02923242
    CC =  +.00515866      C =  +.00458486
                          D =  +.00077579      DD =  +.00091035
                          E =  +.00013655


K =  +.70    N =  +4
                          P =  +.93068581
    AA =  -.15641801      A =  -.16565045
                          B =  +.02925242      BB =  +.02407576
    CC =  -.00424831      C =  -.00515866
                          D =  +.00091035      DD =  +.00074970
                          E =  -.00016065


K =  +.70    N =  +5
                          P =  +.77505550
    AA =  +.16049175      A =  +.15641799
                          B =  +.02407576      BB =  +.02852207
    CC =  +.00499801      C =  +.00424831
                          D =  +.00074970      DD =  +.00088200
                          E =  +.00015230
```

```
K =  +.70    N =  +6
                          P =  +.90945523
    AA =  -.15216967      A =  -.16049174
                          B =  +.02852207      BB =  +.02552405
    CC =  -.00411601      C =  -.00499801
                          D =  +.00088200      DD =  +.00072655
                          E =  -.00015564


K =  +.70    N =  +7
                          P =  +.74896130
    AA =  +.15549570      A =  +.15216965
                          B =  +.02392405      BB =  +.02744006
    CC =  +.00484256      C =  +.00411600
                          D =  +.00072635      DD =  +.00085453
                          E =  +.0001281


K =  +.70    N =  +8
                          P =  +.88115092
    AA =  -.12805362      A =  -.15549568
                          B =  +.02744006      BB =  +.02259769
    CC =  -.00398782      C =  -.00484256
                          D =  +.00085453      DD =  +.00070573
                          E =  -.00015080


K =  +.70    N =  +9
                          P =  +.72565725
    AA =  +.15065132      A =  +.12805365
                          B =  +.02259769      BB =  +.02658552
    CC =  +.00469156      C =  +.00598782
                          D =  +.00070375      DD =  +.00082792
                          E =  +.00012418


K =  +.70    N =  +10
                          P =  +.85569077
    AA =  -.12406579      A =  -.15065131
                          B =  +.02658552      BB =  +.02189396
    CC =  -.00386564      C =  -.00469156
                          D =  +.00082792      DD =  +.00068181
                          E =  -.00014610
```

```
K =  +.70    N =  +11
                          P =  +.70303945
    AA =  +.14595974      A =  +.12406578
                          B =  +.02189396      BB =  +.02575759
    CC =  +.00454545      C =  +.00586365
                          D =  +.00068181      DD =  +.00080215
                          E =  +.00012032


K =  +.70    N =  +12
                          P =  +.82710512
    AA =  -.12020213      A =  -.14595972
                          B =  +.02575759      BB =  +.02121215
    CC =  -.00374331      C =  -.00454545
                          D =  +.00080213      DD =  +.00066058
                          E =  -.00014155


K =  +.70    N =  +13
                          P =  +.68114542
    AA =  +.14141426      A =  +.12020215
                          B =  +.02121215      BB =  +.02495545
    CC =  +.00440590      C =  +.00574551
                          D =  +.00066058      DD =  +.00077715
                          E =  +.00011657


K =  +.70    N =  +14
                          P =  +.80154745
    AA =  -.11645880      A =  -.14141425
                          B =  +.02495545      BB =  +.02055155
    CC =  -.00562674      C =  -.00440390
                          D =  +.00077715      DD =  +.00064001
                          E =  -.00015714


K =  +.70    N =  +15
                          P =  +.65995315
    AA =  +.13701034      A =  +.11645879
                          B =  +.02055155      BB =  +.02417029
    CC =  +.00426675      C =  +.00362674
                          D =  +.00064001      DD =  +.00075295
                          E =  +.00011294
```

K = +.70   N = +16

AA = -.11283204
CC = -.00351380

P = +.77639188
A = -.13701033
B = +.02417829   BB = +.01991153
C = -.00426675
D = +.00075295   DD = +.00062008
E = -.00013287

K = +.70   N = +17

AA = +.13274355
CC = +.00413388

P = +.63938149
A = +.13283202
B = +.01991153   BB = +.02342833
C = +.00351379
D = +.00062008   DD = +.00072950
E = +.00010942

K = +.70   N = +18

AA = -.10931822
CC = -.00340437

P = +.75221341
A = -.13274354
B = +.02342532   BB = +.0192914
C = -.00413388
D = +.00072950   DD = +.00060077
E = -.00012873

K = +.70   N = +19

AA = +.12860965
CC = +.00400514

P = +.61946986
A = +.10931821
B = +.01929144   BB = +.02269581
C = +.00340437
D = +.00060077   DD = +.00070679
E = +.00010601

K = +.70   N = +20

AA = -.10591383
CC = -.00329835

P = +.72878798
A = -.12860964
B = +.02269581   BB = +.01869067
C = -.00400514
D = +.00070679   DD = +.00058206
E = -.00012472

K = +.70   N = +21

AA = +.12460449
CC = +.00388041

P = +.80017835
A = +.10591382
B = +.01869067   BB = +.02198902
C = +.00329835
D = +.00058206   DD = +.00068477
E = +.00010271

K = +.70   N = +22

AA = -.10261546
CC = -.00319563

P = +.70609209
A = -.12460448
B = +.02198902   BB = +.01810860
C = -.00388041
D = +.00068477   DD = +.00056393
E = -.00012084

K = +.70   N = +23

AA = +.12072404
CC = +.00375957

P = +.58148753
A = +.10261544
B = +.01810 60   BB = +.02130424
C = +.00319563
D = +.00056393   DD = +.00066345
E = +.00009951

K = +.70   N = +24

AA = -.09941979
CC = -.00309611

P = +.68410288
A = -.12072403
B = +.02130424   BB = +.01754466
C = -.00375957
D = +.00066345   DD = +.00054637
E = -.00011708

K = +.70   N = +25

AA = +.11696446
CC = +.00364249

P = +.56337809
A = +.09941979
B = +.01754467   BB = +.02064078
C = +.00309611
D = +.00054637   DD = +.00064279
E = +.00009641

K = +.70   N = +26

AA = -.09632367
CC = -.00299969

P = +.66279860
A = -.11696445
B = +.02064078   BB = +.01699829
C = -.00364249
D = +.00064279   DD = +.00052935
E = -.00011343

K = +.70   N = +27

AA = +.11332195
CC = +.00342905

P = +.54583409
A = +.09632365
B = +.01699829   BB = +.01999799
C = +.00299969
D = +.00052935   DD = +.00062277
E = +.00009341

K = +.70   N = +2

AA = -.09332396
CC = -.00290628

P = +.64215768
A = -.11332194
B = +.0199979   BB = +.01646893
C = -.00352905
D = +.00062277   DD = +.00051287
E = -.00010990

K = +.70   N = +29

AA = +.10979287
CC = +.00341915

P = +.52883572
A = +.09332394
B = +.01646893   BB = +.01937521
C = +.00290628
D = +.00051287   DD = +.00060338
E = +.00009050

K = +.70   N = +30

AA = -.09041765
CC = -.00281577

P = +.62215958
A = -.10979288
B = +.01937521   BB = +.01595605
C = -.00341915
D = +.00060338   DD = +.00049690
E = -.00010647

K = +.80   N = +1
```
AA = +.10973936        P = +.80888887
                       A = +.09876542
                       B = +.01097393    BB = +.01219326
CC = +.00135480        C = +.00121932
                       D = +.00015348    DD = +.00015053
                       E = +.00001505
```

K = +.80   N = +2
```
AA = -.09754611        P = +.98765431
                       A = -.10973937
                       B = +.01219326    BB = +.01003845
CC = -.00120427        C = -.00135400
                       D = +.00015053    DD = +.00013380
                       E = -.00001672
```

K = +.80   N = +3
```
AA = +.10838655        P = +.87791491
                       A = +.09754610
                       B = +.01083845    BB = +.01204272
CC = +.00133800        C = +.00120427
                       D = +.00013800    DD = +.00014867
                       E = +.00001406
```

K = +.80   N = +4
```
AA = -.09634184        P = +.97546105
                       A = -.10838496
                       B = +.01204272    BB = +.01070464
CC = -.00118940        C = -.00133808
                       D = +.00014867    DD = +.00013215
                       E = -.00001651
```

K = +.80   N = +5
```
AA = +.10706647        P = +.86707649
                       A = +.09634183
                       B = +.01070464    BB = +.01189405
CC = +.00132156        C = +.00118940
                       D = +.00013215    DD = +.00014684
                       E = +.00001468
```

K = +.80   N = +6
```
AA = -.09515243        P = +.96941830
                       A = -.10704648
                       B = +.01189405    BB = +.01057249
CC = -.00117472        C = -.00132154
                       D = +.00014684    DD = +.00013052
                       E = -.00001631
```

K = +.80   N = +7
```
AA = +.10572490        P = +.85637177
                       A = +.09515241
                       B = +.01057249    BB = +.01174721
CC = +.00130524        C = +.00117472
                       D = +.00015052    DD = +.00014502
                       E = +.00001450
```

K = +.80   N = +8
```
AA = -.09397770        P = +.95152419
                       A = -.10572491
                       B = +.01174721    BB = +.01044196
CC = -.00116021        C = -.00130524
                       D = +.00014502    DD = +.00012891
                       E = -.00001611
```

K = +.80   N = +9
```
AA = +.10441966        P = +.84579927
                       A = +.09397769
                       B = +.01044196    BB = +.01160218
CC = +.00128913        C = +.00116021
                       D = +.00012891    DD = +.00014323
                       E = +.00001432
```

K = +.80   N = +10
```
AA = -.09281748        P = +.93977697
                       A = -.10441968
                       B = +.01160218    BB = +.01031305
CC = -.00114589        C = -.00128913
                       D = +.00014323    DD = +.00012732
                       E = -.00001591
```

K = +.80   N = +11
```
AA = +.10313053        P = +.83535730
                       A = +.09281747
                       B = +.01031305    BB = +.01145894
CC = +.00127321        C = +.00114589
                       D = +.00012732    DD = +.00014146
                       E = +.00001414
```

K = +.80   N = +12
```
AA = -.09167159        P = +.92817478
                       A = -.10313053
                       B = +.01145094    BB = +.01018573
CC = -.00113174        C = -.00127321
                       D = +.00014146    DD = +.00012574
                       E = -.00001571
```

K = +.80   N = +13
```
AA = +.10185730        P = +.82504420
                       A = +.09167157
                       B = +.01018573    BB = +.01133747
CC = +.00125749        C = +.00113174
                       D = +.00012574    DD = +.00013972
                       E = +.00001397
```

K = +.80   N = +14
```
AA = -.09053984        P = +.91671576
                       A = -.10185731
                       B = +.01133747    BB = +.01005998
CC = -.00111777        C = -.00125749
                       D = +.00013972    DD = +.00012419
                       E = -.00001552
```

K = +.80   N = +15
```
AA = +.10059902        P = +.81485856
                       A = +.09053983
                       B = +.01005990    BB = +.01117775
CC = +.00124197        C = +.00111777
                       D = +.00012419    DD = +.00013799
                       E = +.00001379
```

K = +.80   N = +16

```
AA = -.08942207    P = +.90539838
                   A = -.10059982
                   B = +.01117773    BB = +.00993578
CC = -.00110397    C = -.00124197
                   D = +.00013799    DD = +.00012266
                   E = -.00001573
```

K = +.80   N = +17

```
AA = +.09935783    P = +.80479849
                   A = -.09942205
                   B = +.00993578    BB = +.01103975
CC = +.00122664    C = +.00110397
                   D = +.00012266    DD = -.00013629
                   E = +.00001362
```

K = +.80   N = +18

```
AA = -.08831807    P = +.89422055
                   A = -.09935783
                   O = +.01103976    BB = +.00981512
CC = -.00109034    C = -.00122664
                   D = +.00013629    DD = +.00012114
                   E = -.00001514
```

K = +.80   N = +19

```
AA = +.09813120    P = +.79486273
                   A = -.08831808
                   B = +.00981312    BB = +.01090346
CC = +.00121149    C = +.00109034
                   D = +.0001211A    DD = +.00013461
                   E = +.00001346
```

K = +.80   N = +20

```
AA = -.08722773    P = +.88318078
                   A = -.09813119
                   B = +.01090346    BB = +.00969197
CC = -.00107688    C = -.00121149
                   D = +.00013461    DD = +.00011965
                   E = -.00001495
```

K = +.80   N = +21

```
AA = +.09691970    P = +.78504961
                   A = +.08722773
                   D = +.00969197    BB = +.01076885
CC = +.00119653    C = +.00107688
                   D = +.00011965    DD = +.00013294
                   E = +.00001329
```

K = +.80   N = +22

```
AA = -.08615084    P = +.87227729
                   A = -.09691969
                   B = +.01076885    BB = +.00957231
CC = -.00106359    C = -.00119653
                   D = +.00013294    DD = +.00013817
                   E = -.00001477
```

K = +.80   N = +23

```
AA = +.09572316    P = +.77535765
                   A = +.08615084
                   B = +.00957231    BB = +.01063590
CC = +.00118176    C = +.00106359
                   D = +.00011817    DD = +.00013130
                   E = +.00001313
```

K = +.80   N = +24

```
AA = -.08506725    P = +.86190845
                   A = -.09572316
                   B = +.01063590    BB = +.00945414
CC = -.00105046    C = -.00118176
                   D = +.00013130    DD = +.00011671
                   E = -.00001458
```

K = +.80   N = +25

```
AA = +.09454139    P = +.76578532
                   A = +.08506725
                   B = +.00945413    BB = +.01050459
CC = +.00126717    C = +.00105046
                   D = +.00011671    DD = +.00012968
                   E = +.00001296
```

K = +.80   N = +26

```
AA = -.08403679    P = +.85087257
                   A = -.09454139
                   B = +.01050460    BB = +.00933742
CC = -.00103749    C = -.00116717
                   D = +.00012968    DD = +.00011527
                   E = -.00001440
```

K = +.80   N = +27

```
AA = +.09337421    P = +.75633118
                   A = +.08403679
                   B = -.00933742    BB = +.01037491
CC = +.00115276    C = +.00103749
                   D = +.00011527    DD = +.00012808
                   E = +.00001280
```

K = +.80   N = +28

```
AA = -.08299930    P = +.84036801
                   A = -.09337422
                   B = +.01037491    BB = +.00922214
CC = -.00102468    C = -.00115276
                   D = +.00012808    DD = +.00011385
                   E = -.00001423
```

K = +.80   N = +29

```
AA = +.09222144    P = +.74699370
                   A = +.0829992
                   B = +.00922214    BB = +.01024682
CC = +.00113853    C = +.0010246
                   D = +.00011385    DD = +.00012650
                   E = +.00001265
```

K = +.80   N = +30

```
AA = -.08197461    P = +.82999300
                   A = -.09222144
                   B = +.01024682    BB = +.00910829
CC = -.00101203    C = -.00113853
                   D = +.00012650    DD = +.00011244
                   E = -.00001405
```

```
K = +.90   N = +1
                          P = +.94736826
    AA = +.05248577       A = +.04986148
                          B = +.00262428    BB = +.00276240
    CC = +.00014538       C = +.00013812
                          D = +.00000726    DD = +.00000765
                          E = +.00000038

K = +.90   N = +2
                          P = +.99722970
    AA = -.04972336       A = -.05248577
                          B = +.00276240    BB = +.00261701
    CC = -.00013773       C = -.00014538
                          D = +.00000765    DD = +.00000724
                          E = -.00000040

K = +.90   N = +3
                          P = +.94474397
    AA = +.05234038       A = +.04972336
                          B = +.00261701    BB = +.00275475
    CC = +.00014498       C = +.00013773
                          D = +.00000724    DD = +.00000763
                          E = +.00000038

K = +.90   N = +4
                          P = +.99446721
    AA = -.04958562       A = -.05234037
                          B = +.00275475    BB = +.00260976
    CC = -.00013795       C = -.00014498
                          D = +.00000763    DD = +.00000722
                          E = -.00000040

K = +.90   N = +5
                          P = +.94212672
    AA = +.05219538       A = +.04958561
                          B = +.00260976    BB = +.00274712
    CC = +.00014458       C = +.00013795
                          D = +.00000722    DD = +.00000760
                          E = +.00000038


K = +.90   N = +6
                          P = +.99171228
    AA = -.04944825       A = -.05219538
                          B = +.00274712    BB = +.00260253
    CC = -.00013697       C = -.00014458
                          D = +.00000760    DD = +.00000720
                          E = -.00000040

K = +.90   N = +7
                          P = +.93951683
    AA = +.05205079       A = +.04944825
                          B = +.00260253    BB = +.00273951
    CC = +.00014418       C = +.00013697
                          D = +.00000720    DD = +.00000758
                          E = +.00000037

K = +.90   N = +8
                          P = +.98896499
    AA = -.04931127       A = -.05205078
                          B = +.00273951    BB = +.00259533
    CC = -.00013659       C = -.00014418
                          D = +.00000758    DD = +.00000718
                          E = -.00000039

K = +.90   N = +9
                          P = +.93691411
    AA = +.05190659       A = +.04931126
                          B = +.00259532    BB = +.00273192
    CC = +.00014378       C = +.00013659
                          D = +.00000718    DD = +.00000756
                          E = +.00000037

K = +.90   N = +10
                          P = +.98622534
    AA = -.04917467       A = -.05190659
                          B = +.00273192    BB = +.00258814
    CC = -.00013621       C = -.0001437
                          D = +.00000756    DD = +.00000718
                          E = -.00000039


K = +.90   N = +11
                          P = +.93451866
    AA = +.05176280       A = +.04917466
                          B = +.00258814    BB = +.00272435
    CC = +.00014338       C = +.00013621
                          D = +.00000716    DD = +.00000754
                          E = +.00000037

K = +.90   N = +12
                          P = +.98349327
    AA = -.04903844       A = -.05176280
                          B = +.00272435    BB = +.00258097
    CC = -.00013584       C = -.00014338
                          D = +.00000754    DD = +.00000714
                          E = -.00000039

K = +.90   N = +13
                          P = +.93173038
    AA = +.05161941       A = +.04903844
                          B = +.00258097    BB = +.00271681
    CC = +.00014299       C = +.00013584
                          D = +.00000714    DD = +.00000752
                          E = +.00000037

K = +.90   N = +14
                          P = +.98076872
    AA = -.04890259       A = -.05161940
                          B = +.00271681    BB = +.00257382
    CC = -.00013546       C = -.00014299
                          D = +.00000752    DD = +.00000712
                          E = -.00000039

K = +.90   N = +15
                          P = +.92914927
    AA = +.05147441       A = +.04890259
                          B = +.00257382    BB = +.00270928
    CC = +.00014259       C = +.00013546
                          D = +.00000712    DD = +.00000750
                          E = +.00000037
```

```
K =   +.90     N = +16

   AA =  -.04876712     P =  +.47805181
                        A =  -.05167641
                        B =  +.00270928    BB =  +.00256669
   CC =  -.00013508     C =  -.00014259
                        D =  +.00000750    DD =  +.00000710
                        E =  -.00000039


K =   +.90     N = +17

   AA =  +.05133381     P =  +.92657531
                        A =  +.04876712
                        B =  +.00256669    BB =  +.00270177
   CC =  +.00014219     C =  +.00013508
                        D =  +.00000710    DD =  +.00000748
                        E =  +.00000037


K =   +.90     N = +18

   AA =  -.04863202     P =  +.97534233
                        A =  -.05133380
                        B =  +.00270177    BB =  +.00255958
   CC =  -.00013471     C =  -.00014219
                        D =  +.00000748    DD =  +.00000709
                        E =  -.00000039


K =   +.90     N = +19

   AA =  +.05119160     P =  +.92400847
                        A =  +.04863202
                        B =  +.00255958    BB =  +.00269429
   CC =  +.00014180     C =  +.00013471
                        D =  +.00000709    DD =  +.00000746
                        E =  +.00000037


K =   +.90     N = +20

   AA =  -.04849730     P =  +.97264043
                        A =  -.05119160
                        B =  +.00269429    BB =  +.00255248
   CC =  -.00013434     C =  -.00014180
                        D =  +.00000746    DD =  +.00000707
                        E =  -.00000039


K =   +.90     N = +21

   AA =  +.05104979     P =  +.92144878
                        A =  +.04849730
                        B =  +.00255248    BB =  +.00268683
   CC =  +.00014141     C =  +.00013434
                        D =  +.00000707    DD =  +.00000744
                        E =  +.00000037


K =   +.90     N = +22

   AA =  -.04836295     P =  +.96994598
                        A =  -.05104978
                        B =  +.00268683    BB =  +.00254541
   CC =  -.00013396     C =  -.00014141
                        D =  +.00000744    DD =  +.00000705
                        E =  -.00000039


K =   +.90     N = +23

   AA =  +.05090837     P =  +.91889620
                        A =  +.04836295
                        B =  +.00254541    BB =  +.00267938
   CC =  +.00014102     C =  +.00013396
                        D =  +.00000705    DD =  +.00000742
                        E =  +.00000037


K =   +.90     N = +24

   AA =  -.04822898     P =  +.96725907
                        A =  -.05090837
                        B =  +.00267938    BB =  +.00253836
   CC =  -.00013359     C =  -.00014102
                        D =  +.00000742    DD =  +.00000703
                        E =  -.00000039


K =   +.90     N = +25

   AA =  +.05076734     P =  +.91635053
                        A =  +.04822897
                        B =  +.00253836    BB =  +.00267196
   CC =  +.00014062     C =  +.00013359
                        D =  +.00000703    DD =  +.00000740
                        E =  +.00000037


K =   +.90     N = +26

   AA =  -.04809537     P =  +.96457941
                        A =  -.05076733
                        B =  +.00267196    BB =  +.00253133
   CC =  -.00013322     C =  -.00014062
                        D =  +.00000740    DD =  +.00000701
                        E =  -.00000038


K =   +.90     N = +27

   AA =  +.05062670     P =  +.91381200
                        A =  +.04809536
                        B =  +.00253133    BB =  +.00266456
   CC =  +.00014024     C =  +.00013322
                        D =  +.00000701    DD =  +.00000738
                        E =  +.00000036


K =   +.90     N = +28

   AA =  -.04796214     P =  +.96190739
                        A =  -.05062670
                        B =  +.00266456    BB =  +.00252432
   CC =  -.00013285     C =  -.00014024
                        D =  +.0000073     DD =  +.00000699
                        E =  -.00000038


K =   +.90     N = +29

   AA =  +.05048645     P =  +.91128060
                        A =  +.04796213
                        B =  +.00252432    BB =  +.00265718
   CC =  +.00013985     C =  +.00013285
                        D =  +.0000069     DD =  +.00000736
                        E =  +.00000036


K =   +.90     N = +30

   AA =  -.04782927     P =  +.95924265
                        A =  -.05048645
                        B =  +.00265718    BB =  +.00251733
   CC =  -.00013249     C =  -.00013985
                        D =  +.00000736    DD =  +.00000697
                        E =  -.00000038
```

```
K =  +1.00    N = +1                          K =  +1.00    N = +6                          K =  +1.00    N = +11
                        P =  +1.00000000                               P =  +.00000000                               P =  +1.00000000
      AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000
                        B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000
      CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000
                        D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000
                        E =   +.00000000                               E =   +.00000000                               E =   +.00000000

K =  +1.00    N = +2                          K =  +1.00    N = +7                          K =  +1.00    N = +12
                        P =  +1.00000000                               P =  +1.00000000                              P =  +1.00000000
      AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000
                        B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000
      CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000
                        D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000
                        E =   +.00000000                               E =   +.00000000                               E =   +.00000000

K =  +1.00    N = +3                          K =  +1.00    N = +8                          K =  +1.00    N = +13
                        P =  +1.00000000                               P =  +1.00000000                              P =  +1.00000000
      AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000
                        B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000
      CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000
                        D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000
                        E =   +.00000000                               E =   +.00000000                               E =   +.00000000

K =  +1.00    N = +4                          K =  +1.00    N = +9                          K =  +1.00    N = +14
                        P =  +1.00000000                               P =  +1.00000000                              P =  +1.00000000
      AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000
                        B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000
      CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000
                        D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000
                        E =   +.00000000                               E =   +.00000000                               E =   +.00000000

K =  +1.00    N = +5                          K =  +1.00    N = +10                         K =  +1.00    N = +15
                        P =  +1.00000000                               P =  +1.00000000                              P =  +1.00000000
      AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000             AA =  +.00000000  A =   +.00000000
                        B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000                B =   +.00000000  BB =  +.00000000
      CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000             CC =  +.00000000  C =   +.00000000
                        D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000                D =   +.00000000  DD =  +.00000000
                        E =   +.00000000                               E =   +.00000000                               E =   +.00000000
```

K = +1.00   N = +16

```
                          P =  +1.00000000
        AA =  +.00090000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00090000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +17

```
                          P =  +1.00000000
        AA =  +.00090000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +18

```
                          P =  +1.00000000
        AA =  +.00090000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +19

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +20

```
                          P =  +1.00000000
        AA =  +.00060000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +21

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +22

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +23

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +24

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +25

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +26

```
                          P =  +1.00000000
        AA =  +.00090000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +27

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +28

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +29

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

K = +1.00   N = +30

```
                          P =  +1.00000000
        AA =  +.00000000   A =  +.00000000
                           B =  +.00000000   BB =  +.00000000
        CC =  +.00000000   C =  +.00000000
                           D =  +.00000000   DD =  +.00000000
                           E =  +.00000000
```

```
K = +1.50   N = +1
                              P = +1.20000000
   AA = -.19200000           A = -.24000000
                              B = +.04800000    BB = +.03840000
   CC = +.00768000           C = -.00960000
                              D = +.00192000    DD = +.00153600
                              E = -.00038400

K = +1.50   N = +2
                              P = +.96000000
   AA = +.23040000           A = +.19200000
                              B = +.03840000    BB = +.04608000
   CC = +.00921600           C = +.00768000
                              D = +.00153600    DD = +.00184320
                              E = +.00030720

K = +1.50   N = +3
                              P = +1.15200000
   AA = -.18432000           A = -.23040000
                              B = +.04608000    BB = +.03686400
   CC = -.00737280           C = -.00921600
                              D = +.00184320    DD = +.00147456
                              E = -.00036864

K = +1.50   N = +4
                              P = +.92159996
   AA = +.22118398           A = +.18431999
                              B = +.03686399    BB = +.04423679
   CC = +.00884735           C = +.00737279
                              D = +.00147455    DD = +.00176947
                              E = +.00029491

K = +1.50   N = +5
                              P = +1.10591990
   AA = -.17694719           A = -.22118398
                              B = +.04423679    BB = +.03538943
   CC = -.00707788           C = -.00884735
                              D = +.00176947    DD = +.00141557
                              E = -.00035389


K = +1.50   N = +6
                              P = +.88473595
   AA = +.21233662           A = +.17694719
                              B = +.03538943    BB = +.04246732
   CC = +.00849366           C = +.00707788
                              D = +.00141557    DD = +.00169869
                              E = +.00028311

K = +1.50   N = +7
                              P = +1.06168310
   AA = -.16986930           A = -.21233662
                              B = +.04246732    BB = +.03397386
   CC = -.00679477           C = -.00849346
                              D = +.00169869    DD = +.00135895
                              E = -.00033973

K = +1.50   N = +8
                              P = +.84934651
   AA = +.20384316           A = +.16986930
                              B = +.03397386    BB = +.04076863
   CC = +.00815372           C = +.00679477
                              D = +.00135895    DD = +.00163074
                              E = +.00027179

K = +1.50   N = +9
                              P = +1.01921590
   AA = -.16307455           A = -.20384318
                              B = +.04076863    BB = +.03261490
   CC = -.00652298           C = -.00815372
                              D = +.00163074    DD = +.00130459
                              E = -.00032614

K = +1.50   N = +10
                              P = +.81537271
   AA = +.19568944           A = +.16307454
                              B = +.03261490    BB = +.03911788
   CC = +.00782757           C = +.00652298
                              D = +.00130459    DD = +.00156551
                              E = +.00026091


K = +1.50   N = +11
                              P = +.97944725
   AA = -.15655156           A = -.19568945
                              B = +.03913789    BB = +.03131031
   CC = +.00626206           C = -.00782757
                              D = +.00156551    DD = +.00125241
                              E = -.00031310

K = +1.50   N = +12
                              P = +.78275785
   AA = +.18786188           A = +.15655157
                              B = +.03131031    BB = +.03737237
   CC = +.00751447           C = +.00626206
                              D = +.00125241    DD = +.00150289
                              E = +.00025048

K = +1.50   N = +13
                              P = +.93930931
   AA = -.15028949           A = -.18786186
                              B = +.03757237    BB = +.03005789
   CC = -.00601157           C = -.00751447
                              D = +.00150289    DD = +.00120231
                              E = -.00030057

K = +1.50   N = +14
                              P = +.75144751
   AA = +.18034740           A = +.15028950
                              B = +.03005790    BB = +.03606948
   CC = +.00721389           C = +.00601154
                              D = +.00120231    DD = -.00144277
                              E = +.00024046

K = +1.50   N = +15
                              P = +.90173694
   AA = -.14427792           A = -.18034739
                              B = +.03604947    BB = +.02885558
   CC = -.00577111           C = -.00721389
                              D = +.00144277    DD = +.00115422
                              E = -.00028855
```

K = +1.50   N = +16

```
AA =  +.17315530      P =  +.72138961
CC =  +.00692594      A =  +.14427792
                      B =  +.02885558      BB =  +.03462670
                      C =  +.00577111      DD =  -.00138506
                      D =  +.00115422
                      E =  +.00023084
```

K = +1.50   N = +17

```
AA =  -.13850681      P =  +.86566748
CC =  -.00554027      A =  -.17313350
                      B =  +.03462069      BB =  +.02770156
                      C =  -.00692533      DD =  +.00110805
                      D =  +.00138506
                      E =  -.00027701
```

K = +1.50   N = +18

```
AA =  +.16620816      P =  +.69253401
CC =  +.00664832      A =  +.13850680
                      B =  +.02770156      BB =  +.03324163
                      C =  +.00554027      DD =  +.00132966
                      D =  +.00110805
                      E =  +.00022161
```

K = +1.50   N = +19

```
AA =  -.13296652      P =  +.83104075
CC =  -.00531866      A =  -.16620815
                      B =  +.03324163      BB =  +.02659350
                      C =  -.00664832      DD =  +.00106373
                      D =  +.00132966
                      E =  -.00026593
```

K = +1.50   N = +20

```
AA =  +.15955983      P =  +.66483263
CC =  +.00638239      A =  +.13296653
                      B =  +.02659330      BB =  +.03191196
                      C =  +.00531866      DD =  +.00127647
                      D =  +.00106373
                      E =  +.00021274
```

K = +1.50   N = +21

```
AA =  -.12764788      P =  +.79779922
CC =  -.00510591      A =  -.15955984
                      B =  +.03191196      BB =  +.02552957
                      C =  -.00638259      DD =  +.00102118
                      D =  +.00127647
                      E =  -.00025529
```

K = +1.50   N = +22

```
AA =  +.15317745      P =  +.63823938
CC =  +.00612709      A =  +.12764788
                      B =  +.02552957      BB =  +.03063549
                      C =  +.00510591      DD =  +.00122541
                      D =  +.00102118
                      E =  +.00020423
```

K = +1.50   N = +23

```
AA =  -.12254198      P =  +.76588719
CC =  -.00490167      A =  -.15317744
                      B =  +.03063548      BB =  +.02450839
                      C =  -.00612709      DD =  +.00098033
                      D =  -.00122541
                      E =  -.00024508
```

K = +1.50   N = +24

```
AA =  +.14705034      P =  -.61270976
CC =  +.00588201      A =  +.12254195
                      B =  +.02450859      BB =  +.02941006
                      C =  +.00490167      DD =  +.00117640
                      D =  +.00098033
                      E =  +.00019606
```

K = +1.50   N = +25

```
AA =  -.11764028      P =  +.73525169
CC =  -.00470561      A =  -.14705034
                      B =  +.02941006      BB =  +.02352805
                      C =  -.00588201      DD =  +.00094112
                      D =  +.00117640
                      E =  -.00023528
```

K = +1.50   N = +26

```
AA =  +.14116853      P =  +.58820158
CC =  +.00564673      A =  +.11764028
                      B =  +.02352805      BB =  +.02823366
                      C =  +.00470561      DD =  +.00112934
                      D =  +.00094112
                      E =  +.00018822
```

K = +1.50   N = +27

```
AA =  -.11295466      P =  +.70584160
CC =  -.00451738      A =  -.14116832
                      B =  +.02823366      BB =  +.02258693
                      C =  -.00564673      DD =  +.00090347
                      D =  +.00112934
                      E =  -.00022586
```

K = +1.50   N = +28

```
AA =  +.13552159      P =  +.56467332
CC =  +.00542086      A =  +.11295466
                      B =  +.02258693      BB =  +.02710431
                      C =  +.00451758      DD =  +.00108417
                      D =  +.00090347
                      E =  +.00018069
```

K = +1.50   N = +29

```
AA =  -.10841728      P =  +.67760800
CC =  -.00433669      A =  -.13552160
                      B =  +.02710432      BB =  +.02168345
                      C =  -.00542086      DD =  +.00086735
                      D =  +.00108417
                      F =  -.00021683
```

K = +1.50   N = +30

```
AA =  +.13010074      P =  +.54208644
CC =  +.00520402      A =  +.10841729
                      B =  +.02168345      BB =  +.02602014
                      C =  +.0043366       DD =  +.00104080
                      D =  +.00086733
                      E =  +.00017346
```

K = +2.00   N = +1

AA = -.29629629   A = -.44444445   P = +1.33333330
                   B = +.14814814   BB = +.09876543
CC = -.05292180   C = -.04958271
                   D = +.01646090   DD = +.01097393
                   E = -.00548696

K = +2.00   N = +2

AA = +.39506170   A = +.29629628   P = +.88888884
                   B = +.09876542   BB = +.13168723
CC = +.04389574   C = +.03292180
                   D = +.01097393   DD = +.01463191
                   E = +.00365797

K = +2.00   N = +3

AA = -.26337447   A = -.39506170   P = +1.18518510
                   B = +.13168723   BB = +.08779149
CC = -.02926382   C = -.04389574
                   D = +.01463191   DD = +.00975461
                   E = -.00487730

K = +2.00   N = +4

AA = +.35116396   A = +.26337447   P = +.79012342
                   B = +.08779149   BB = +.11703532
CC = +.03901844   C = +.02926383
                   D = +.00975461   DD = +.01300614
                   E = +.00325153

K = +2.00   N = +5

AA = -.23411062   A = -.35116593   P = +1.05349780
                   B = +.11703531   BB = +.07803486
CC = -.02601229   C = -.03901843
                   D = +.01300614   DD = +.00867076
                   E = -.00433538

K = +2.00   N = +6

AA = +.31214751   A = +.23411064   P = +.70235192
                   B = +.07803687   BB = +.10404917
CC = +.03468305   C = +.02601229
                   D = +.00867076   DD = +.01156101
                   E = +.00289025

K = +2.00   N = +7

AA = -.20809835   A = -.31214752   P = +.93644258
                   B = +.10404917   BB = +.06936612
CC = -.02312205   C = -.03468305
                   D = +.01156101   DD = +.00770734
                   E = -.00585367

K = +2.00   N = +8

AA = +.27746442   A = +.20809832   P = +.62429497
                   B = +.06936610   BB = +.09248814
CC = +.03082938   C = +.02312203
                   D = +.00770734   DD = +.01027646
                   E = +.00256911

K = +2.00   N = +9

AA = -.18497630   A = -.27746444   P = +.83239532
                   B = +.09248814   BB = +.06165876
CC = -.02055292   C = -.03082938
                   D = +.01027646   DD = +.00685097
                   E = -.00342540

K = +2.00   N = +10

AA = +.24663505   A = +.1849762   P = +.55492888
                   B = +.06165876   BB = +.08221168
CC = +.02740389   C = +.02055292
                   D = +.00685097   DD = +.00913463
                   E = +.00228365

K = +2.00   N = +11

AA = -.16442333   A = -.24663505   P = +.73990513
                   B = +.08221168   BB = +.05480778
CC = -.01826926   C = -.02740389
                   D = +.00913463   DD = +.00608975
                   E = -.00304483

K = +2.00   N = +12

AA = +.21923113   A = +.1644235   P = +.49327014
                   B = +.05480779   BB = +.07307705
CC = +.02435901   C = +.01826926
                   D = +.00608975   DD = +.00811967
                   E = +.00202991

K = +2.00   N = +13

AA = -.14615410   A = -.21923115   P = +.65769347
                   B = +.07307705   BB = -.04871803
CC = -.01623934   C = -.02435901
                   D = +.00811963   DD = +.00541311
                   E = -.00270633

K = +2.00   N = +14

AA = +.19487213   A = +.14615410   P = +.43846251
                   B = +.04871803   BB = +.06495737
CC = +.02165245   C = +.01623934
                   D = +.00541311   DD = +.00721748
                   E = +.00180437

K = +2.00   N = +15

AA = -.12991474   A = -.19487211   P = +.58461635
                   B = +.06495737   BB = +.04330491
CC = -.01443497   C = -.02165245
                   D = +.00721748   DD = +.00481165
                   E = -.00240582

```
· K = +2.00    N = +16                                        K = +2.00    N = +21                                        K = +2.00    N = +26

                              P =   +.38976423                                               P =   +.41059473                                               P =   +.21628097
        AA =  +.17321965      A =   +.12991474                        AA =  -.09124328       A =   -.13686491                        AA =  +.09612460       A =   +.07209345
                              B =   +.04330491   BB = +.05773988                              B =   +.04562163   BB = +.03041442                             B =   +.02403115   BB = +.03204153
        CC =  +.01924662      C =   +.01443497                        CC =  -.01013814       C =   -.01520721                        CC =  +.01068051       C =   +.00801038
                              O =   +.00481165   00 = +.00641554                              O =   +.00506907   DD = +.00337938                             O =   +.00267012   00 = +.00356017
                              E =   +.00160388                                               E =   -.0016896                                               E =   +.00089004


  K = +2.00    N = +17                                        K = +2.00    N = +22                                        K = +2.00    N = +27

                              P =   +.51965899                                               P =   +.27372983                                               P =   +.28837385
        AA =  -.11547973      A =   -.17321966                        AA =  +.12165770       A =   +.09124327                        AA =  -.06408307       A =   -.09612461
                              B =   +.05773988   BB = +.03849325                              B =   +.03041442   BB = +.04055256                             B =   +.03204153   BB = +.02136102
        CC =  -.01283108      C =   -.01924662                        CC =  +.01991752       C =   +.01013814                        CC =  -.00712054      C =   -.01068051
                              O =   +.00641554   DD = +.00427702                              O =   +.00337938   00 = +.00450584                             O =   +.00356017   00 = +.00237344
                              E =   -.00213851                                               E =   +.00112646                                               E =   -.00118672


  K = +2.00    N = +18                                        K = +2.00    N = +23                                        K = +2.00    N = +28

                              P =   +.34643932                                               P =   +.36497313                                               P =   +.19224925
        AA =  +.15597302      A =   +.11547977                        AA =  -.08110514       A =   -.12165771                        AA =  +.08544411       A =   +.06408308
                              B =   +.03849325   BB = +.05132414                              B =   +.04055257   BB = +.02703504                             B =   +.02136102   BB = +.02848117
        CC =  +.01710811      C =   +.0128310                         CC =  -.00901168       C =   -.01351752                        CC =  +.00949378      C =   +.00712034
                              D =   +.00427702   DD = +.00570270                              D =   +.00450584   DD = +.00300389                             O =   +.00237344   DO = +.00316459
                              E =   +.00142567                                               E =   -.00150194                                               E =   +.00079114


  K = +2.00    N = +19                                        K = +2.00    N = +24                                        K = +2.00    N = +29

                              P =   +.46191907                                               P =   +.24331540                                               P =   +.25633246
        AA =  -.10264868      A =   -.15597302                        AA =  +.10814017       A =   -.08110513                        AA =  -.05696276       A =   -.08544415
                              B =   +.05132434   BB = +.03421622                              B =   +.02703504   BB = +.03604672                             B =   +.02848158   OB = +.01898759
        CC =  -.01140540      C =   -.01710811                        CC =  +.01201557       C =   -.00901168                        CC =  -.00632919      C =   -.00949379
                              O =   +.00570270   00 = +.00380180                              O =   +.00300389   00 = +.00400519                             O =   +.00316459   00 = +.00210973
                              E =   -.00190090                                               E =   +.00100129                                               E =   -.00105486


  K = +2.00    N = +20                                        K = +2.00    N = +25                                        K = +2.00    N = +30

                              P =   +.30794605                                               P =   +.32442052                                               P =   +.17088816
        AA =  +.13686490      A =   +.10264868                        AA =  -.07209345       A =   -.10814017                        AA =  -.07595029       A =   +.05696271
                              B =   +.03421622   BB = +.04562163                              B =   +.03604672   BB = +.02403115                             B =   +.01898757   BB = +.02551676
        CC =  +.01520721      C =   +.01140540                        CC =  -.00801038       C =   -.01201557                        CC =  +.00843892      C =   +.00632919
                              O =   +.00580180   00 = +.00506907                              O =   +.00400519   00 = +.00267012                             D =   +.00210973   00 = +.00281297
                              E =   +.00126726                                               E =   -.00133506                                               E =   +.00070324
```

```
K = +2.50    N = +1                                          K = +2.50    N = +6                                          K = +2.50    N = +11

                    P =  +1.42857140                                             P =  +.54399101                                             P =  +.53787089
     AA = +.34985422  A =  -.61224487                             AA = +.33305571  A =  +.23313900                            AA = -.12682553  A =  -.22194466
                      B =  +.26239065   BB = +.14993752                            B =  +.09991671   BB = +.14273815                            B =  +.09511913   BB = +.05435379
     CC = -.06425894  C =  -.11245313                             CC = +.06117349  C =  +.04282144                            CC = -.02329448  C =  -.04076534
                      D =  +.04819419   DD = +.02753954                            D =  +.01835204   DD = +.02621721                            D =  +.01747086   DD = +C00998334
                      E =  -.02065465                                             E =  +.00786518                                             E =  -.00748751

K = +2.50    N = +2                                          K = +2.50    N = +7                                          K = +2.50    N = +12

                    P =  +.81632649                                             P =  +.77719000                                             P =  +.29592621
     AA = +.49979171  A =  +.34985620                             AA = -.19031755  A =  -.33305571                            AA = +.18117931  A =  +.12682552
                      B =  +.14993751   BB = +.21419644                            B =  +.14273816   BB = +.08156487                            B =  +.05435379   BB = +.07764827
     CC = +.09179847  C =  +.06425893                             CC = -.03495628  C =  -.06117349                            CC = +.03327782  C =  +.0232944
                      D =  +.02753954   DD = +.03934220                            D =  +.02621721   DD = +.01498126                            D =  +.00998334   DD = +.01426192
                      E =  +.01180266                                             E =  -.01123594                                             E =  +.00427857

K = +2.50    N = +3                                          K = +2.50    N = +8                                          K = +2.50    N = +13

                    P =  +1.16618070                                            P =  +.44407427                                             P =  +.42275174
     AA = -.28559528  A =  -.49979172                             AA = +.27188219  A =  +.19031754                            AA = -.10353104  A =  -.18117931
                      B =  +.21419644   BB = +.12239797                            B =  +.08156465   BB = +.11652093                            B =  +.07764827   BB = +.04437044
     CC = -.05245627  C =  -.09179847                             CC = +.04993754  C =  +.03495628                            CC = -.01901590  C =  -.03327783
                      D =  +.03934220   DD = +.02248125                            D =  +.01498126   DD = +.02140180                            D =  +.01426192   DD = +.00814967
                      E =  -.01686094                                             E =  +.00642054                                             E =  -.00611225

K = +2.50    N = +4                                          K = +2.50    N = +9                                          K = +2.50    N = +14

                    P =  +.66638895                                             P =  +.63489189                                             P =  +.24357242
     AA = +.40799322  A =  +.28559526                             AA = -.15536128  A =  -.2718 223                            AA = +.14790148  A =  +.10353104
                      B =  +.12239796   BB = +.17485423                            B =  +.11652095   BB = +.06658340                            B =  +.04437044   BB = +.06338634
     CC = +.07493752  C =  +.05245627                             CC = -.02853574  C =  -.04993755                            CC = +.02716557  C =  -.01901590
                      D =  +.02248125   DD = +.03211608                            D =  +.02140180   DD = +.01222960                            D =  +.00814967   DD = +.01164238
                      E =  +.00963482                                             E =  -.00917220                                             E =  +.00348271

K = +2.50    N = +5                                          K = +2.50    N = +10                                         K = +2.50    N = +15

                    P =  +.95198422                                             P =  +.36250964                                             P =  +.34510343
     AA = -.23313899  A =  -.40799323                             AA = +.22194467  A =  +.15536127                            AA = -.08451513  A =  -.14790147
                      B =  +.17485424   BB = +.09991672                            B =  +.06658340   BB = +.09511914                            B =  +.06338634   BB = +.03622076
     CC = -.04282144  C =  -.07493752                             CC = +.04076534  C =  +.02853574                            CC = -.01552318  C =  -.02716557
                      D =  +.03211608   DD = +.01835204                            D =  +.01222960   DD = +.01747086                            D =  +.03164238   DD = +.00665279
                      E =  -.01376403                                             E =  +.00524125                                             E =  -.00498959
```

K = +2.50   N = +16

AA = +.12075589

P = +.19720197
A = +.08451512
B = +.03622076   BB = +.05174395
C = +.01552518
CC = +.02217597
D = +.00665279   DD = +.00950399
E = +.00285119

K = +2.50   N = +17

AA = -.06899195

P = +.28171714
A = -.12073991
B = +.05174596   BB = +.02956797
C = -.02217598
CC = -.01267199
D = +.00950399   DD = +.00543085
E = -.00407313

K = +2.50   N = +18

AA = +.09855994

P = +.16098124
A = +.06899195
B = +.02956798   BB = +.04223997
C = +.01267199
CC = +.01610284
D = +.00543085   DD = +.00775836
E = +.00252750

K = +2.50   N = +19

AA = -.05631995

P = +.22997516
A = -.09855992
B = +.04223996   BB = +.02413712
C = -.01810284
CC = -.01034448
D = +.00775836   DD = +.00443334
E = -.00332501

K = +2.50   N = +20

AA = +.08045705

P = +.13141320
A = +.05631994
B = +.02413711   BB = +.03448159
C = +.01034447
CC = +.01477782
D = +.00443334   DD = +.00633335
E = +.00190000

K = +2.50   N = +21

AA = -.04597545

P = +.18773310
A = -.08045704
B = +.05448158   BB = +.01970376
C = -.01477782
CC = -.00844447
D = +.00633335   DD = +.00361905
E = -.00271429

K = +2.50   N = +22

AA = +.06567926

P = +.10727614
A = +.04597548
B = +.01970578   BB = +.02814875
C = +.00844447
CC = +.01206353
D = +.00361906   DD = +.00517008
E = +.00155102

K = +2.50   N = +23

AA = -.03753101

P = +.15525164
A = -.06567927
B = +.02814825   BB = +.01608472
C = -.01206353
CC = -.00689345
D = +.00917008   DD = +.00295433
E = -.00221575

K = +2.50   N = +24

AA = +.05361571

P = +.08757234
A = +.03753100
B = +.01608471   BB = +.02297816
C = +.00689344
CC = +.00984778
D = +.00295433   DD = +.00422047
E = +.00126614

K = +2.50   N = +25

AA = -.03063752

P = +.12510324
A = -.05361567
B = +.02297814   BB = +.01317036
C = -.00984777
CC = -.00562730
D = +.00422047   DD = +.00241170
E = -.00180677

K = +2.50   N = +26

AA = +.04576788

P = +.07148754
A = +.03063751
B = +.01315036   BB = +.01875766
C = +.00562729
CC = +.00803899
D = +.00241169   DD = +.00344528
E = +.0010335

K = +2.50   N = +27

AA = -.02501024

P = +.10212517
A = -.04576792
B = +.01875768   BB = +.01071867
C = -.00803900
CC = -.00459371
D = +.00344528   DD = +.00196873
E = -.00147655

K = +2.50   N = +28

AA = +.03572891

P = +.05855725
A = +.02501024
B = +.01071867   BB = +.01531239
C = +.00459371
CC = +.00656245
D = +.00196873   DD = +.00281248
E = +.00084374

K = +2.50   N = +29

AA = -.02041652

P = +.08336748
A = -.03572892
B = +.01551239   BB = +.00874994
C = -.00656245
CC = -.00374997
D = +.00281248   DD = +.00160713
E = -.00120534

K = +2.50   N = +30

AA = +.02916645

P = +.04763854
A = +.02041652
B = +.00874993   BB = +.01249991
C = +.00374997
CC = +.00535710
D = +.00160713   DD = +.00229590
E = +.00068877

```
K = +3.00    N = +1
                         P  = +1.49999990
    AA = -.37499997      A  = -.74999995
                         B  = +.37499998   BB = +.18749999
    CC = -.09375000      C  = -.18749999
                         D  = +.09374999   DD = +.04687499
                         E  = -.04687499

K = +3.00    N = +2
                         P  = +.74999990
    AA = +.56249993      A  = +.37499995
                         B  = +.18749998   BB = +.28124996
    CC = +.14062498      C  = +.09374998
                         D  = +.04687499   DD = +.07031249
                         E  = +.02343749

K = +3.00    N = +3
                         P  = +1.12499980
    AA = -.28124995      A  = -.56249990
                         B  = +.28124995   BB = +.14062497
    CC = -.07031250      C  = -.14062498
                         D  = +.07031248   DD = +.03515624
                         E  = -.03515624

K = +3.00    N = +4
                         P  = +.56249992
    AA = +.42187494      A  = +.28124996
                         B  = +.14062498   BB = +.21093747
    CC = +.10546873      C  = +.07031249
                         D  = +.03515624   DD = +.05273436
                         E  = +.01757812

K = +3.00    N = +5
                         P  = +.84374975
    AA = -.21093744      A  = -.42187488
                         B  = +.21093744   BB = +.10546872
    CC = -.05273437      C  = -.10546872
                         D  = +.05273435   DD = +.02636717
                         E  = -.02636718


K = +3.00    N = +6
                         P  = +.42187488
    AA = +.31640616      A  = +.21093744
                         B  = +.10546872   BB = +.15820308
    CC = +.07910154      C  = +.05273436
                         D  = +.02636718   DD = +.03955077
                         E  = +.01318359

K = +3.00    N = +7
                         P  = +.63281227
    AA = -.15820307      A  = -.31640614
                         B  = +.15820307   BB = +.07910154
    CC = -.03955076      C  = -.07910153
                         D  = +.03955076   DD = +.01977538
                         E  = -.01977538

K = +3.00    N = +8
                         P  = +.31640616
    AA = +.23730462      A  = +.15820308
                         B  = +.0791015A   BB = +.11865231
    CC = +.05932615      C  = +.03955077
                         D  = +.01977538   DD = +.02966307
                         E  = +.00988769

K = +3.00    N = +9
                         P  = +.47460916
    AA = -.11865229      A  = -.23730458
                         B  = +.11865229   BB = +.05932615
    CC = -.02966307      C  = -.05932614
                         D  = +.02966307   DD = +.01483153
                         E  = -.01483153

K = +3.00    N = +10
                         P  = +.23730460
    AA = +.17797845      A  = +.11865230
                         B  = +.05932615   BB = +.08898922
    CC = +.04449461      C  = +.02966307
                         D  = +.01483153   DD = +.02224730
                         E  = +.00741576


K = +3.00    N = +11
                         P  = +.35595686
    AA = -.08898922      A  = -.17797843
                         B  = +.08898921   BB = +.04449460
    CC = -.02224730      C  = -.04449460
                         D  = +.02224730   DD = +.01112365
                         E  = -.01112365

K = +3.00    N = +12
                         P  = +.17797842
    AA = +.13348381      A  = +.08898921
                         B  = +.04449460   BB = +.06674190
    CC = +.03337095      C  = +.02224730
                         D  = +.01112365   DD = +.01668547
                         E  = +.00556182

K = +3.00    N = +13
                         P  = +.26696760
    AA = -.06674190      A  = -.13348380
                         B  = +.06674190   BB = +.03337095
    CC = -.01668547      C  = -.03337095
                         D  = +.01668547   DD = +.00834273
                         E  = -.00834273

K = +3.00    N = +14
                         P  = +.13348381
    AA = +.10011285      A  = +.06674190
                         B  = +.03337095   BB = +.05005642
    CC = +.02502821      C  = +.01668547
                         D  = +.00834273   DD = +.01251410
                         E  = +.00417136

K = +3.00    N = +15
                         P  = +.20022563
    AA = -.05005642      A  = -.10011282
                         B  = +.05005640   BB = +.02502820
    CC = -.01251410      C  = -.02902820
                         D  = +.01251410   DD = +.00625705
                         E  = -.00625705
```

AA = +.07508462
CC = +.01877115

P = +.10011283
A = +.05006641
B = +.02502020   BB = +.03754231
C = +.01251410
D = +.00625705   DD = +.00938557
E = +.00312852

K = +3.00   N = +17

AA = -.03754231
CC = -.00938558

P = +.15016927
A = -.07508463
B = +.03754231   BB = +.01877115
C = -.01877115
D = +.00938557   DD = +.00469278
E = -.00469278

K = +3.00   N = +18

AA = +.05631348
CC = +.01407837

P = +.07508464
A = +.03754232
B = +.01877116   BB = +.02815674
C = +.00938558
D = +.00469279   DD = +.00703918
E = +.00234639

K = +3.00   N = +19

AA = -.02815674
CC = -.00703918

P = +.11262698
A = -.05631349
B = +.02815674   BB = +.01407837
C = -.01407837
D = +.00703918   DD = +.00351959
E = -.00351959

K = +3.00   N = +20

AA = +.04223508
CC = +.01055877

P = +.05631344
A = +.02815672
B = +.01407836   BB = +.02111754
C = +.00703918
D = +.00351959   DD = +.00527938
E = +.00175979

K = +3.00   N = +21

AA = -.02111753
CC = -.00527938

P = +.08447015
A = -.04223507
B = +.02111753   BB = +.01055876
C = -.01055876
D = +.00527938   DD = +.00263969
E = -.00263969

K = +3.00   N = +22

AA = +.03167691
CC = +.00791907

P = +.04223508
A = +.02111754
B = +.01055877   BB = +.01583815
C = +.00527938
D = +.00263969   DD = +.00395953
E = +.00131984

K = +3.00   N = +23

AA = -.01583815
CC = -.00395953

P = +.06335261
A = -.03167630
B = +.01583815   BB = +.00791907
C = -.00791907
D = +.00395953   DD = +.00197976
E = -.00197976

K = +3.00   N = +24

AA = +.02375723
CC = +.00593930

P = +.03167631
A = +.01583815
B = +.00791907   BB = +.01187861
C = +.00395953
D = +.00197976   DD = +.00296965
E = +.00098988

K = +3.00   N = +25

AA = -.01187861
CC = -.00296965

P = +.04751446
A = -.02375723
B = +.01187861   BB = +.00593930
C = -.00593930
D = +.00296965   DD = +.00148482
E = -.00148482

K = +3.00   N = +26

AA = +.01781792
CC = +.00445448

P = +.02375723
A = +.01187861
B = +.00593930   BB = +.00890896
C = +.00296965
D = +.00148482   DD = +.00222724
E = +.00074241

K = +3.00   N = +27

AA = -.00890896
CC = -.00222724

P = +.03563585
A = -.01781792
B = +.00890896   BB = +.00445448
C = -.00445448
D = +.00222724   DD = +.00111362
E = -.00111362

K = +3.00   N = +28

AA = +.01336344
CC = +.00334086

P = +.01781793
A = +.00890896
B = +.00445448   BB = +.00668172
C = +.00222724
D = +.00111362   DD = +.00167043
E = +.00055681

K = +3.00   N = +29

AA = -.00668172
CC = -.00167043

P = +.02672689
A = -.01336344
B = +.00668172   BB = +.00334086
C = -.00334086
D = +.00167043   DD = -.00083521
E = -.00083521

K = +3.00   N = +30

AA = +.01002258
CC = +.00250564

P = +.01336344
A = +.00668172
B = +.00334086   BB = +.00501129
C = +.00167043
D = +.00083521   DD = +.00125282
E = +.00041760

K = +3.50   N = +1

```
                    P =  +1.55555550
AA =  -.38408778    A =   -.86419749
                    B =   +.48010971    BB =  +.71338209
CC =  -.11854561    C =   -.26672762
                    D =   +.14818201    DD =  +.06585868
                    E =   -.08232333
```

K = +3.50   N = +6

```
                    P =  +.33045238
44 =  +.28557612    4 =   +.18358465
                    B =   +.10199147    BB =  +.15865339
CC =  +.08814077    C =   +.05666192
                    D =   +.03147884    DD =  +.04896709
                    E =   +.01748824
```

K = +3.50   N = +11

```
                    P =  +.24569725
44 =  -.06066599    A =   -.13649847
                    B =   +.07585248    BB =  +.03370332
CC =  -.01872407    C =   -.04212915
                    D =   +.02340508    DD =  +.01040226
                    E =   -.01300202
```

K = +3.50   N = +2

```
                    P =  +.69155792
AA =  +.59746980    4 =   +.58408775
                    B =   +.21558207    BB =  +.33192766
CC =  +.18440425    C =   +.11854559
                    D =   +.06585866    DD =  +.10244680
                    E =   +.05658814
```

K = +3.50   N = +7

```
                    P =  +.51405699
44 =  -.12692271    A =   -.28557610
                    B =   +.15865339    BB =  +.07051262
CC =  -.03917367    C =   -.08814077
                    D =   +.04896709    DD =  +.02176315
                    E =   -.02720394
```

K = +3.50   N = +12

```
                    P =  +.10919078
AA =  +.09456991    4 =   +.06066598
                    B =   +.03370332    BB =  +.05242739
CC =  +.02912633    C =   +.01872407
                    D =   +.01040226    DD =  +.01618129
                    E =   +.00577903
```

K = +3.50   N = +3

```
                    P =  +1.07544560
AA =  -.26954212    4 =   -.59746977
                    B =   +.33192765    BB =  +.14752340
CC =  -.08195745    C =   -.18440425
                    D =   +.10244680    DD =  +.04553191
                    E =   -.05691489
```

K = +3.50   N = +8

```
                    P =  +.22846088
AA =  +.19743932    A =   +.12692271
                    B =   +.07051261    BB =  +.10968629
CC =  +.06093682    C =   +.03917367
                    D =   +.02176315    DD =  +.03585379
                    E =   +.01209064
```

K = +3.50   N = +13

```
                    P =  +.16986476
AA =  +.04194191    A =   -.09436931
                    B =   +.05242739    BB =  +.02330106
CC =  +.01294503    C =   -.02912633
                    D =   +.01618129    DD =  +.00719168
                    E =   -.00898960
```

K = +3.50   N = +4

```
                    P =  +.47797584
AA =  +.41306553    A =   -.26954213
                    B =   +.14752340    BB =  +.22948084
CC =  +.12748938    C =   -.08195744
                    D =   +.04553191    DD =  +.07082742
                    E =   +.02529550
```

K = +3.50   N = +9

```
                    P =  +.35538358
44 =  -.08774903    A =   -.19743932
                    B =   +.10968629    BB =  +.04874947
CC =  -.02708303    C =   -.06093682
                    D =   +.05383379    DD =  +.01504613
                    E =   -.01880766
```

K = +3.50   N = +14

```
                    P =  +.07549546
AA =  +.06924299    A =   +.04194192
                    B =   +.02330106    BB =  -.03624610
CC =  +.02013672    C =   +.01294503
                    D =   +.00719168    DD =  +.01118706
                    E =   +.00399538
```

K = +3.50   N = +5

```
                    P =  +.74351784
AA =  -.18358465    4 =   -.41306546
                    B =   +.22948081    BB =  +.10199147
CC =  -.05666195    C =   -.12748954
                    D =   +.07082741    DD =  +.03147889
                    E =   -.03994856
```

K = +3.50   N = +10

```
                    P =  +.15794825
AA =  +.13649848    A =   +.08774902
                    B =   +.04874945    BB =  +.07583249
CC =  +.04212916    C =   +.02708303
                    D =   +.01504612    DD =  +.02340508
                    E =   +.00835896
```

K = +3.50   N = +15

```
                    P =  +.11743730
44 =  -.028996 8    A =   -.06524298
                    B =   +.03624610    BB =  +.01610938
CC =  -.00894965    C =   -.02013672
                    D =   +.01118706    DD =  +.00497203
                    E =   -.00621503
```

K = +3.50   N = +16

    AA = +.04510622
    CC = +.01392167

    P = +.05219435
    A = +.02899686
    B = +.01610956   BB = +.02505901
    C = +.00894964
    D = +.00497202   DD = +.00773426
    E = +.00276223

K = +3.50   N = +17

    AA = -.02004721
    CC = -.00618741

    P = +.08119125
    A = -.04510624
    B = +.02505902   BB = -.01113734
    C = -.01392167
    D = +.00773426   DD = +.00343745
    E = -.00429681

K = +3.50   N = +18

    AA = +.03118456
    CC = +.00962486

    P = +.09608500
    A = +.02004722
    B = +.01113754   BB = +.01732475
    C = +.00618741
    D = +.00343745   DD = +.00534714
    E = +.0019096

K = +3.50   N = +19

    AA = -.01385981
    CC = -.00427771

    P = +.05615223
    A = -.03118457
    B = +.01752476   BB = +.00769989
    C = -.00962486
    D = +.00534714   DD = +.00237651
    E = -.00297063

K = +3.50   N = +20

    AA = +.02155969
    CC = +.00865422

    P = +.02494764
    A = +.01385980
    B = +.00769988   BB = -.01197760
    C = +.00427771
    D = +.00237650   DD = +.00369679
    E = +.00132028

K = +3.50   N = +21

    AA = -.00958208
    CC = -.00295745

    P = +.03880745
    A = -.02155969
    B = +.01197760   BB = +.00532338
    C = -.00665422
    D = +.00369679   DD = +.00164301
    E = -.00205377

K = +3.50   N = +22

    AA = +.01490547
    CC = +.00460045

    P = +.01724776
    A = +.00958208
    B = +.00532338   BB = +.00828081
    C = -.00295743
    D = +.00164301   DD = +.00255580
    E = +.00091278

K = +3.50   N = +23

    AA = -.00662465
    CC = -.00204464

    P = +.02682983
    A = -.01490547
    B = +.00828081   BB = +.00368036
    C = -.00460045
    D = +.00255580   DD = +.00113591
    E = -.0014198V

K = +5.50   N = +24

    AA = +.01030501
    CC = +.00318055

    P = +.01192837
    A = +.00662465
    B = +.00568036   BB = +.00372500
    C = -.00204464
    D = +.00113591   DD = +.00176697
    E = +.00063106

K = +3.50   N = +24

    AA = -.00458000
    CC = -.00141358

    P = +.01894902
    A = -.01030501
    B = +.00572500   BB = +.00254444
    C = -.00318055
    D = +.00176697   DD = +.00078532
    E = -.00098165

K = +3.50   N = +26

    AA = +.00712449
    CC = +.00219890

    P = +.00824401
    A = +.00458000
    B = +.00254444   BB = +.00395803
    C = +.00141358
    D = +.00078532   DD = +.00122161
    E = +.00043629

K = +3.50   N = +27

    AA = -.00316642
    CC = -.00097729

    P = +.01282402
    A = -.00712445
    B = +.00395803   BB = +.00175912
    C = -.00219890
    D = +.00122161   DD = +.00054293
    E = -.00067867

K = +3.50   N = +28

    AA = +.00492555
    CC = +.00152023

    P = +.00569956
    A = +.00316642
    B = +.00175912   BB = +.00273641
    C = +.00097729
    D = +.00054293   DD = +.00084457
    E = +.00030163

K = +3.50   N = +29

    AA = -.00218913
    CC = -.00067565

    P = +.00886598
    A = -.00492555
    B = +.00273641   BB = +.00121618
    C = -.00152023
    D = +.00084457   DD = +.00037536
    E = -.00046920

K = +3.50   N = +30

    AA = +.00340551
    CC = +.00105102

    P = +.00394043
    A = +.00218913
    B = +.00121618   BB = +.00189184
    C = +.00067565
    D = +.00037536   DD = +.00058390
    E = +.00020853

```
K = +4.00    N = +1

                    P = +1.59999990
AA = -.38399998     A = -.95999994
                    B = +.57599996    BB = +.23039998
CC = -.13823999     C = -.34559998
                    D = +.20735999    DD = +.08294400
                    E = -.12441599


K = +4.00    N = +2

                    P = +.63999991
AA = +.61439992     A = +.38399995
                    B = -.23039997    BB = +.36863995
CC = +.22118396     C = +.13823998
                    D = +.08294398    DD = +.13271038
                    E = +.04976639


K = +4.00    N = +3

                    P = +1.02399990
AA = -.24575998     A = -.61439994
                    B = +.36863996    BB = +.14745598
CC = -.08847359     C = -.22118398
                    D = +.13271039    DD = +.05308416
                    E = -.07962623


K = +4.00    N = +4

                    P = +.40959994
AA = +.39321594     A = +.24575996
                    B = +.1474559?    BB = +.23592956
CC = +.14155773     C = +.08847358
                    D = +.05308415    DD = +.08493464
                    E = +.03185049


K = +4.00    N = +5

                    P = +.65535980
AA = -.15728635     A = -.39321588
                    B = +.235 2953    BB = +.09437181
CC = -.05662309     C = -.14155772
                    D = +.08495463    DD = +.03397385
                    E = -.05096077


K = +4.00    N = +6

                    P = +.26214395
AA = +.25165819     A = +.15728537
                    B = +.09437182    BB = +.15099491
CC = +.09059694     C = +.05662309
                    D = +.03397385    DD = +.05435817
                    E = +.02038431


K = +4.00    N = +7

                    P = +.41943029
AA = -.10046327     A = -.25165817
                    B = +.15099490    BB = +.06039796
CC = -.03623877     C = -.09059694
                    D = +.05435816    DD = +.02174326
                    E = -.03261489


K = +4.00    N = +8

                    P = +.16777212
AA = +.16106123     A = +.10046327
                    B = +.06039796    BB = +.09663674
CC = +.05798204     C = +.03623877
                    D = +.02174326    DD = +.03478922
                    E = +.01304596


K = +4.00    N = +9

                    P = +.26843535
AA = -.06442449     A = -.16106121
                    B = +.09663672    BB = +.03865469
CC = -.02319281     C = -.05798203
                    D = +.03478922    DD = +.01391568
                    E = -.02087353


K = +4.00    N = +10

                    P = +.10737414
AA = +.10307917     A = +.06442468
                    B = +.03865469    BB = +.06184750
CC = +.03710850     C = +.02319281
                    D = +.01391568    DD = +.02222510
                    E = +.00834941


K = +4.00    N = +11

                    P = +.17179864
AA = -.04123167     A = -.10307918
                    B = +.06184751    BB = +.02473900
CC = -.01484340     C = -.03710850
                    D = -.02226510    DD = +.00890604
                    E = -.01335906


K = +4.00    N = +12

                    P = +.06871943
AA = +.06597065     A = +.04123166
                    B = +.02473899    BB = +.03958239
CC = +.02374943     C = +.01484339
                    D = +.00890603    DD = +.01424966
                    E = +.00534362


K = +4.00    N = +13

                    P = +.10995117
AA = -.02638828     A = -.06597070
                    B = +.03958242    BB = +.01583296
CC = -.00949978     C = -.02374945
                    D = +.01424967    DD = +.00569986
                    E = -.00854980


K = +4.00    N = +14

                    P = +.04398045
AA = +.04222123     A = +.02638827
                    B = +.01583296    BB = +.02533274
CC = +.01519964     C = +.00949977
                    D = +.00569986    DD = +.00 11978
                    E = +.00341992


K = +4.00    N = +15

                    P = +.07036867
AA = -.01688848     A = -.04222120
                    B = +.02533272    BB = +.01013308
CC = -.00607985     C = -.01519963
                    D = +.00911978    DD = +.00364791
                    E = -.00547186
```

K = +4.00   N = +16

```
AA =  +.02702156        P =  +.02814746
                        A =  +.01668847
                        B =  +.01013308    BB =  +.01621293
CC =  +.00972776        C =  +.00607985
                        D =  +.00364791    DD =  +.00583665
                        E =  +.00218874
```

K = +4.00   N = +17

```
AA =  -.01080864        P =  +.04503600
                        A =  -.02702160
                        B =  +.01621296    BB =  +.00648518
CC =  -.00389111        C =  -.00972777
                        D =  +.00583666    DD =  +.00233466
                        E =  -.00350199
```

K = +4.00   N = +18

```
AA =  +.01729382        P =  +.01801439
                        A =  +.01080863
                        B =  +.00648518    BB =  +.01037629
CC =  +.00622577        C =  +.00389110
                        D =  +.00233466    DD =  +.00373546
                        E =  +.00140079
```

K = +4.00   N = +19

```
AA =  -.00691752        P =  +.02882501
                        A =  -.01729381
                        B =  +.01037628    BB =  +.00415051
CC =  -.00249030        C =  -.00622577
                        D =  +.00373546    DD =  +.00149418
                        E =  -.00224127
```

K = +4.00   N = +20

```
AA =  +.01106803        P =  +.01152920
                        A =  +.00691752
                        B =  +.00415051    BB =  +.00664082
CC =  +.00398449        C =  +.00249050
                        D =  +.00149418    DD =  +.00239069
                        E =  +.00089651
```

K = +4.00   N = +21

```
AA =  -.00442721        P =  +.01844673
                        A =  -.01106804
                        B =  +.00664082    BO =  +.00265632
CC =  -.00159379        C =  -.00398449
                        D =  +.00239069    DD =  +.00095627
                        E =  -.00143441
```

K = +4.00   N = +22

```
AA =  +.00708354        P =  +.00797869
                        A =  +.00442721
                        B =  +.00265632    BB =  +.00425012
CC =  +.00255007        C =  +.00159379
                        D =  +.00095627    DD =  +.00153004
                        E =  +.00057376
```

K = +4.00   N = +23

```
AA =  -.00283341        P =  +.01180591
                        A =  -.00708354
                        B =  +.00425012    BB =  +.00170005
CC =  -.00102003        C =  -.00255007
                        D =  +.00153004    DD =  +.00061201
                        E =  -.00091802
```

K = +4.00   N = +24

```
AA =  +.00453346        P =  +.00472236
                        A =  +.00283341
                        B =  +.00170005    BB =  +.00272008
CC =  +.00163204        C =  +.00102003
                        D =  +.00061201    DD =  +.00097922
                        E =  +.00036721
```

K = +4.00   N = +25

```
AA =  -.00181338        P =  +.00755578
                        A =  -.00453346
                        B =  +.00272008    BB =  +.00108803
CC =  -.00065281        C =  -.00163204
                        D =  +.00097922    DD =  +.00039169
                        E =  -.00058753
```

K = +4.00   N = +26

```
AA =  +.00290142        P =  +.00302231
                        A =  +.00181338
                        B =  +.00108803    BB =  +.00174085
CC =  +.00104451        C =  +.00065281
                        D =  +.00039169    DD =  +.00062670
                        E =  +.00023501
```

K = +4.00   N = +27

```
AA =  -.00116056        P =  +.00483569
                        A =  -.00290141
                        B =  +.00174085    BB =  +.00069634
CC =  -.00041780        C =  -.00104451
                        D =  +.00062670    DD =  +.00025068
                        E =  -.00037602
```

K = +4.00   N = +28

```
AA =  +.00185690        P =  +.00193428
                        A =  +.00116056
                        B =  +.00069634    BB =  +.00111414
CC =  +.00066848        C =  +.00041780
                        D =  +.00025068    DD =  +.00040109
                        E =  +.00015040
```

K = +4.00   N = +29

```
AA =  -.00074276        P =  +.00309484
                        A =  -.00185690
                        B =  +.00111414    BB =  +.00044565
CC =  -.00026739        C =  -.00066848
                        D =  +.00040109    DD =  +.00016043
                        E =  -.00024065
```

K = +4.00   N = +30

```
AA =  +.00118842        P =  +.00123793
                        A =  +.00074276
                        B =  +.00044565    BB =  +.00071305
CC =  +.00042783        C =  +.00026739
                        D =  +.00016043    DD =  +.00025669
                        E =  +.00009626
```

```
K = +4.50   N = +1

      AA =  -.37866270    P =  +1.63636360
                          A =  -1.04132230
                          B =  +.66265963    BB =  +.24096714
      CC =  -.15334274    C =  -.42169249
                          D =  +.26834975    DD =  +.09758172
                          E =  -.17076803


K = +4.50   N = +2

      AA =  +.81962981    P =  +.59504133
                          A =  +.37866266
                          B =  +.24096715    BB =  +.39430988
      CC =  +.25092446    C =  +.15554273
                          D =  +.09758173    DD =  +.15987919
                          E =  +.06209746


K = +4.50   N = +3

      AA =  -.22531993    P =  +.97370397
                          A =  -.61962979
                          B =  +.39430986    BB =  +.14338540
      CC =  -.09124527    C =  -.25092446
                          D =  +.15967919    DD =  +.05806516
                          E =  -.10161403


K = +4.50   N = +4

      AA =  +.36870532    P =  +.35407417
                          A =  +.22531992
                          B =  +.14338540    BB =  +.23463065
      CC =  +.14933041    C =  +.09124525
                          D =  +.05806516    DD =  +.09501571
                          E =  +.03695055


K = +4.50   N = +5

      AA =  -.13407468    P =  +.57930416
                          A =  -.36870537
                          B =  +.23443049    BB =  +.08552025
      CC =  -.05429472    C =  -.14931044
                          D =  +.09501572    DD =  +.03455117
                          E =  -.06046455


K = +4.50   N = +6

      AA =  +.21939492    P =  +.21068878
                          A =  +.13407468
                          B =  +.08552024    BB =  +.13961495
      CC =  +.08884587    C =  +.05429470
                          D =  +.03455117    DD =  +.05653828
                          E =  +.02198711


K = +4.50   N = +7

      AA =  -.07977998    P =  +.34476346
                          A =  -.21939493
                          B =  +.19963495    BB =  +.05076708
      CC =  -.03230759    C =  -.08884587
                          D =  +.05653828    DD =  +.02055937
                          E =  -.03597890


K = +4.50   N = +8

      AA =  +.13054904    P =  +.12536859
                          A =  +.07977997
                          B =  +.05076907    BB =  +.08307666
      CC =  +.05286696    C =  +.03230759
                          D =  +.02055937    DD =  +.03364261
                          E =  +.01308323


K = +4.50   N = +9

      AA =  -.04747238    P =  +.20514849
                          A =  -.13054904
                          B =  +.08307666    BB =  +.03020969
      CC =  -.01922435    C =  -.05286696
                          D =  +.03364261    DD =  +.01223367
                          E =  -.02140893


K = +4.50   N = +10

      AA =  +.07768206    P =  +.07459944
                          A =  +.04747238
                          B =  +.03020969    BB =  +.04943405
      CC =  +.03145803    C =  +.01922435
                          D =  +.01223367    DD =  +.02001874
                          E =  +.00778506


K = +4.50   N = +11

      AA =  -.02824802    P =  +.12207183
                          A =  -.07768207
                          B =  +.04943404    BB =  +.01797601
      CC =  -.01143928    C =  -.03145802
                          D =  +.02001874    DD =  +.00727954
                          E =  -.01273920


K = +4.50   N = +12

      AA =  +.04622404    P =  +.04438975
                          A =  +.02824802
                          B =  +.01797601    BB =  +.02941529
      CC =  +.01871882    C =  +.01143928
                          D =  +.00727954    DD =  +.01191398
                          E =  +.00463243


K = +4.50   N = +13

      AA =  -.01680874    P =  +.07263778
                          A =  -.04622404
                          B =  +.02941530    BB =  +.01069647
      CC =  -.00680684    C =  -.01871882
                          D =  +.01191198    DD =  +.00433163
                          E =  -.00758035


K = +4.50   N = +14

      AA =  +.02750521    P =  +.02641374
                          A =  +.01680874
                          B =  +.01069647    BB =  +.01750331
      CC =  +.01113847    C =  +.00680684
                          D =  +.00433162    DD =  +.00708812
                          E =  +.00275649


K = +4.50   N = +15

      AA =  -.01000189    P =  +.04322245
                          A =  -.02750520
                          B =  +.01750331    BB =  +.00636484
      CC =  -.00408035    C =  -.01113847
                          D =  +.00708811    DD =  +.00257749
                          E =  -.00451061
```

```
K = +4.50   N = +16

                          P =   +.01571727
     AA =  +.01636674     A =   +.01000190
                          B =   +.00636484    BB =  +.01041520
     CC =  +.00662785     C =   +.00405035
                          D =   +.00257749    DD =  +.00421772
                          E =   +.00164022


K = +4.50   N = +17

                          P =   +.02571918
     AA =  -.00595154     A =   -.01636675
                          B =   +.01041520    BB =  +.00378734
     CC =  -.00241013     C =   -.00662785
                          D =   +.00421772    DD =  +.00153371
                          E =   -.00268400


K = +4.50   N = +18

                          P =   +.00935243
     AA =  +.00973889     A =   +.00595154
                          B =   +.00378734    BB =  +.00619747
     CC =  +.00394384     C =   +.00241013
                          D =   +.00153371    DD =  +.00250972
                          E =   +.00097600


K = +4.50   N = +19

                          P =   +.01530397
     AA =  -.00354141     A =   -.00973888
                          B =   +.00619747    BB =  +.00225362
     CC =  -.00143412     C =   -.00394384
                          D =   +.00250972    DD =  +.00091262
                          E =   -.00159709


K = +4.50   N = +20

                          P =   +.00556507
     AA =  +.00579404     A =   +.00354141
                          B =   +.00225362    BB =  +.00368775
     CC =  +.00234675     C =   +.00143412
                          D =   +.00091262    DD =  +.00149338
                          E =   +.00058076
```

```
K = +4.50   N = +21

                          P =   +.00910648
     AA =  -.00210728     A =   -.00579503
                          B =   +.00368775    BB =  +.00134100
     CC =  -.00085336     C =   -.00234675
                          D =   +.00149338    DD =  +.00054304
                          E =   -.00095035


K = +4.50   N = +22

                          P =   +.00331145
     AA =  +.00344828     A =   +.00210728
                          B =   +.00134100    BB =  +.00219436
     CC =  +.00139641     C =   +.00085336
                          D =   +.00054304    DD =  +.00088862
                          E =   +.00034557


K = +4.50   N = +23

                          P =   +.00541873
     AA =  -.00125392     A =   -.00344828
                          B =   +.00219436    BB =  +.00079795
     CC =  -.00050778     C =   -.00139641
                          D =   +.00088862    DD =  -.00032313
                          E =   -.00056549


K = +4.50   N = +24

                          P =   +.00197045
     AA =  +.00205187     A =   +.00125392
                          B =   +.00079795    BB =  +.00130573
     CC =  +.00083092     C =   +.00050778
                          D =   +.00032313    DD =  +.00052876
                          E =   +.00020563


K = +4.50   N = +25

                          P =   +.00322437
     AA =  -.00074613     A =   -.00205187
                          B =   +.00130573    BB =  +.00047481
     CC =  -.00030215     C =   -.00083092
                          D =   +.00052876    DD =  +.00019227
                          E =   -.00093648
```

```
K = +4.50   N = +26

                          P =   +.00117250
     AA =  +.00122095     A =   +.00074613
                          B =   +.00047481    BB =  +.00077696
     CC =  +.00049443     C =   +.00030215
                          D =   +.00019228    DD =  +.00031464
                          E =   +.00012236


K = +4.50   N = +27

                          P =   +.00191863
     AA =  -.00044398     A =   -.00122095
                          B =   +.00077696    BB =  +.00028253
     CC =  -.00017979     C =   -.00049443
                          D =   +.00031464    DD =  +.00011441
                          E =   -.00020022


K = +4.50   N = +28

                          P =   -.00069768
     AA =  +.00072651     A =   +.00044398
                          B =   +.00028253    BB =  +.00046232
     CC =  +.00029420     C =   +.00017979
                          D =   +.00011441    DD =  +.00018722
                          E =   +.00007280


K = +4.50   N = +29

                          P =   +.00114166
     AA =  -.00026418     A =   -.00072651
                          B =   +.00046232    BB =  +.00016811
     CC =  -.00010698     C =   -.00029420
                          D =   +.00018722    DD =  +.00006808
                          E =   -.00011914


K = +4.50   N = +30

                          P =   +.00041515
     AA =  +.00043230     A =   +.00026418
                          B =   +.00016811    BB =  +.00027510
     CC =  +.00017506     C =   +.00010698
                          D =   +.00006808    DD =  +.00011140
                          E =   +.00004332
```

```
K = +5.00    N = +1
                        P  = -1.66666660
    AA = -.37037040    A  = -1.11111110
                        B  = +.74074070    BB = +.24691357
    CC = -.16460904    C  = -.49382713
                        D  = +.32921809    DD = +.10973937
                        E  = -.21947872

K = +5.00    N = +2
                        P  = +.55555548
    AA = +.61726386    A  = +.37037052
                        B  = +.24691354    BB = +.41152257
    CC = +.27434838    C  = +.16460903
                        D  = +.10973935    DD = +.18289891
                        E  = +.07315956

K = +5.00    N = +3
                        P  = -.92592589
    AA = -.20576131    A  = -.61728392
                        B  = +.41152261    BB = +.13717420
    CC = -.09144947    C  = -.27434841
                        D  = +.18289894    DD = +.06096632
                        E  = -.12193282

K = +5.00    N = +4
                        P  = +.30864194
    AA = +.34293548    A  = +.20576129
                        B  = +.13717419    BB = +.22862365
    CC = +.15241577    C  = +.09144946
                        D  = +.06096630    DD = +.10181051
                        E  = +.04064420

K = +5.00    N = +5
                        P  = +.51440322
    AA = -.11431183    A  = -.34293548
                        B  = +.22862365    BB = +.07620788
    CC = -.05080526    C  = -.15241577
                        D  = +.10181051    DD = +.03387017
                        E  = -.06774034


K = +5.00    N = +6
                        P  = +.17146774
    AA = +.19051971    A  = +.11431183
                        B  = +.07620788    BB = +.12701313
    CC = +.08467542    C  = +.05080525
                        D  = +.03387017    DD = +.09645028
                        E  = +.02258011

K = +5.00    N = +7
                        P  = +.28577957
    AA = -.06350657    A  = -.19051971
                        B  = +.12701314    BB = +.04233772
    CC = -.02822514    C  = -.08467542
                        D  = +.05645028    DD = +.01881676
                        E  = -.03763352

K = +5.00    N = +8
                        P  = +.09525965
    AA = +.10584427    A  = +.06350656
                        B  = +.04233771    BB 3 = +.07056285
    CC = +.04704190    C  = +.02822514
                        D  = +.01881676    DD = +.03136126
                        E  = +.01254450

K = +5.00    N = +9
                        P  = +.15876642
    AA = -.03528143    A  = -.10584428
                        B  = +.07056285    BB = +.02352095
    CC = -.01568063    C  = -.04704190
                        D  = +.03136126    DD = +.01045375
                        E  = -.02090751

K = +5.00    N = +10
                        P  = +.05292213
    AA = +.05880237    A  = +.03528142
                        B  = +.02352095    BB = +.03920158
    CC = +.02613438    C  = +.01588083
                        D  = +.01045375    DD = +.01742292
                        E  = +.00696917


K = +5.00    N = +11
                        P  = +.08820359
    AA = -.01960079    A  = -.05880239
                        B  = -.03920159    BB = +.01506719
    CC = -.00871146    C  = -.02613439
                        D  = +.01742293    DD = +.00580764
                        E  = -.0116152

K = +5.00    N = +12
                        P  = +.02940117
    AA = +.03266797    A  = +.01960078
                        B  = +.01306718    BB = +.02177864
    CC = +.01451909    C  = +.00871145
                        D  = +.00580763    DD = +.00967939
                        E  = +.00387175

K = +5.00    N = +13
                        P  = +.04900198
    AA = -.01088932    A  = -.03266797
                        B  = +.02177864    BB = +.00725955
    CC = -.00483970    C  = -.01451909
                        D  = +.00967939    DD = +.00322666
                        E  = -.00645293

K = +5.00    N = +14
                        P  = +.01633399
    AA = +.01814887    A  = +.01088932
                        B  = +.00725955    BB = +.01209925
    CC = +.00806616    C  = +.00483970
                        D  = +.00322646    DD = +.00537744
                        E  = +.00215097

K = +5.00    N = +15
                        P  = +.02722330
    AA = -.00604962    A  = -.01814886
                        B  = +.01209924    BB = +.00403308
    CC = -.00268872    C  = -.00806616
                        D  = +.00537744    DD = +.00179248
                        E  = -.00358496
```

K = +5.00   N = +16
AA = +.01008270
CC = +.00448120
P = +.00907443
A = +.00604962
B = +.00403308   BB = +.00672180
C = +.00268872
D = +.00179248   DD = +.00298746
E = +.00119498

K = +5.00   N = +17
AA = -.00936090
CC = -.00149373
P = +.01312408
A = -.01008271
B = +.00672180   BB = +.00224060
C = -.00448120
D = +.00298746   DD = +.00099582
E = -.00199164

K = +5.00   N = +18
AA = +.00560150
CC = +.00248955
P = +.00504135
A = +.00936090
B = +.00224060   BB = +.00373433
C = +.00149373
D = +.00099582   DD = +.00165970
E = +.00066388

K = +5.00   N = +19
AA = -.00186716
CC = -.00082985
P = +.00840225
A = -.00560150
B = +.00373433   BB = +.00124477
C = -.00248955
D = +.00165970   DD = +.00055323
E = -.00110647

K = +5.00   N = +20
AA = +.00311194
CC = +.00138308
P = +.00280075
A = +.00186716
B = +.00124477   BB = +.00207463
C = +.00082985
D = +.00055323   DD = +.00092205
E = +.00036882

K = +5.00   N = +21
AA = -.00103731
CC = -.00046102
P = +.00466792
A = -.00311194
B = +.00207463   BB = +.00069154
C = -.00198308
D = +.00092205   DD = +.00050735
E = -.00061470

K = +5.00   N = +22
AA = +.00172885
CC = +.00076838
P = +.00155597
A = +.00103731
B = +.00069154   BB = +.00115257
C = +.00046102
D = +.00030735   DD = +.00051225
E = +.00020490

K = +5.00   N = +23
AA = -.00057628
CC = -.00025612
P = +.0025932
A = -.00172885
B = +.00115257   BB = +.00038419
C = -.00076838
D = +.00051225   DD = +.00017075
E = -.00034150

K = +5.00   N = +24
AA = +.00096047
CC = +.00042687
P = +C00086443
A = +.00057628
B = +.00038419   BB = +.00064031
C = +.00025612
D = +.00017075   DD = +.00028458
E = +.00011583

K = +5.00   N = +25
AA = -.00032015
CC = -.00014229
P = +.00144071
A = -.00096047
B = +.00064031   BB = +.00021343
C = -.00042687
D = +.00028458   DD = +.00009486
E = -.00018972

K = +5.00   N = +26
AA = +.00053359
CC = +.00023715
P = +.00048023
A = +.00032015
B = +.00021343   BB = +.00035573
C = +.00014229
D = +.00009486   DD = +.00015810
E = +.00006324

K = +5.00   N = +27
AA = -.00017786
CC = -.00007905
P = +.00080039
A = -.00053359
B = +.00035573   BB = +.00011857
C = -.00023715
D = +.00015810   DD = +.00005270
E = -.00010540

K = +5.00   N = +28
AA = +.0002984
CC = +.00013175
P = +.00026679
A = +.00017786
B = +.00011857   BB = +.00019762
C = +.00007905
D = +.00005270   DD = +.00008783
E = +.00003513

K = +5.00   N = +29
AA = -.00009881
CC = -.00004391
P = +.00044466
A = -.00029644
B = +.00019762   BB = +.00006587
C = -.00013175
D = +.00008783   DD = +.00002927
E = -.00005855

K = +5.00   N = +30
AA = +.00016469
CC = +.00007519
P = +.00014822
A = +.00009881
B = +.00006587   BB = +.00010979
C = +.00004391
D = +.00002927   DD = +.00004079
E = +.00001451

```
K = +5.5D    N = +1
                              P =  +1.6923D770
    AA =  -.3604918D          A =  -1.1715976D
                              B =  +.81110606    BB =  +.2495711D
    CC =  -.172780DD          C =  -.56153496
                              D =  +.38875496    DD =  +.11961691
                              E =  -.26917805


K = +5.5D    N = +2
                              P =  +.52071D1D
    AA =  +.6100D272          A =  +.56049161
                              B =  +.24957111    BB =  +.42235111
    CC =  +.29239692          C =  +.17278D0D
                              D =  +.11961692    DD =  +.20242863
                              E =  +.D8281171


K = +5.50    N = +3
                              P =  +.8812D165
    AA =  -.18771159          A =  -.610D626B
                              B =  +.42235109    BB =  +.12995419
    CC =  -.08996828          C =  -.2923969B
                              D =  +.20242862    DD =  +.06228573
                              E =  -.14014289


K = +5.50    N = +4
                              P =  +.27113898
    AA =  +.51766579          A =  +.1877116D
                              B =  +.12995419    BB =  +.21992247
    CC =  +.152254D1          C =  +.08996828
                              D =  +.06228575    DD =  +.1054D662
                              E =  +.D4312089


K = +5.50    N = +5
                              P =  +.45885055
    AA =  -.09774331          A =  -.31766576
                              B =  +.21992245    BB =  +.06766845
    CC =  -.04684738          C =  -.152254DD
                              D =  +.1054D662    DD =  +.03243281
                              E =  -.07297381


K = +5.5D    N = +6
                              P =  +.14118479
    AA =  +.16541176          A =  +.09774351
                              B =  +.06766845    BB =  +.11451583
    CC =  +.D7928019          C =  +.04684738
                              D =  +.0324328D    DD =  +.05488628
                              E =  +.02245348


K = +5.50    N = +7
                              P =  +.2389281D
    AA =  -.05D89595          A =  -.16541176
                              B =  +.11451583    BB =  +.D3523564
    CC =  -.02439390          C =  -.07928D19
                              D =  +.05488628    DD =  +.016888D8
                              E =  -.03799819


K = +5.50    N = +8
                              P =  +.07351634
    AA =  +.08613157          A =  +.05089592
                              B =  +.03523564    BB =  +.05962954
    CC =  +.04128199          C =  +.D2459390
                              D =  +.D188880H    DD =  +.02857984
                              E =  +.D1189175


K = +5.50    N = +9
                              P =  +.12441226
    AA =  -.026502D1          A =  -.08613156
                              B =  +.05962954    BB =  +.01834755
    CC =  -.D127D215          C =  -.04128199
                              D =  +.D2857984    DD =  +.DD 79379
                              E =  -.01978604


K = +5.50    N = +10
                              P =  +.09820D69
    AA =  +.04484957          A =  +.0265D2D2
                              B =  +.D1834755    BB =  +.03104970
    CC =  +.02149594          C =  +.D127D215
                              D =  +.00879379    DD =  +.01488181
                              E =  +.006D8601


K = +5.50    N = +11
                              P =  +.06478274
    AA =  -.D1379987          A =  -.D4484959
                              B =  +.D3104971    BB =  +.0D955575
    CC =  -.DD661414          C =  -.D2149595
                              D =  +.D1488181    DD =  +.DD4579D2
                              E =  -.01D30279


K = +5.5D    N = +12
                              P =  +.01993315
    AA =  +.02335363          A =  +.01379987
                              B =  +.0D9553 5    BB =  +.01616790
    CC =  +.01119316          C =  +.00661414
                              D =  +.00457902    DD =  +.0D774911
                              E =  +.00317DD9


K = +5.5D    N = +13
                              P =  +.03373302
    AA =  -.00718575          A =  -.D2335363
                              B =  +.D1616789    BB =  +.00497473
    CC =  -.003444D5          C =  -.D1119316
                              D =  +.00774911    DD =  +.00238434
                              E =  -.00536476


K = +5.50    N = +14
                              P =  +.01037939
    AA =  +.D1216047          A =  +.D0718573
                              B =  +.D0497473    BB =  +.00841878
    CC =  +.0D582839          C =  +.0D344404
                              D =  +.D0238434    DD =  +.00405504
                              E =  +.00165069


K = +5.5D    N = +15
                              P =  +.D1756512
    AA =  -.DD374168          A =  -.D1216D47
                              B =  +.D0841878    BB =  +.00259059
    CC =  -.DD179335          C =  -.DD582839
                              D =  +.D0401503    DD =  +.DD124155
                              E =  -.00279348
```

K = +5.50   N = +16

```
                      P =  +.00540465
     AA =  +.00633207  A =  +.00574168
                      B =  +.00259039   BB =  +.00438374
     CC =  +.00303490  C =  +.00179535
                      D =  +.00124159   DD =  +.00210108
                      E =  +.00085953
```

K = +5.50   N = +17

```
                      P =  +.00914633
     AA =  -.00194833  A =  -.00633207
                      B =  +.00438374   BB =  +.00134884
     CC =  -.00093381  C =  -.00303490
                      D =  +.00210108   DD =  +.00064648
                      E =  -.00145459
```

K = +5.50   N = +18

```
                      P =  +.00281425
     AA =  +.00329717  A =  +.00194833
                      B =  +.00134884   BB =  +.00228266
     CC =  +.00158030  C =  +.00093381
                      D =  +.00064648   DD =  +.00109405
                      E =  +.00044756
```

K = +5.50   N = +19

```
                      P =  +.00476258
     AA =  -.00101451  A =  -.00329717
                      B =  +.00228266   BB =  +.00070235
     CC =  -.0004862A  C =  -.00158030
                      D =  +.00109405   DD =  +.00055663
                      E =  -.00075742
```

K = +5.50   N = +20

```
                      P =  +.00146541
     AA =  +.00171687  A =  +.00101451
                      B =  +.00070235   BB =  +.00118860
     CC =  +.00082287  C =  +.00048624
                      D =  +.00055663   DD =  +.00056968
                      E =  +.00025305
```

K = +5.50   N = +21

```
                      P =  +.00247992
     AA =  -.00052826  A =  -.00171687
                      B =  +.00118860   BB =  +.00036572
     CC =  -.00025319  C =  -.00082287
                      D =  +.00056968   DD =  +.00017528
                      E =  -.00039439
```

K = +5.50   N = +22

```
                      P =  +.00076305
     AA =  +.00089399  A =  +.00052826
                      B =  +.00036572   BB =  +.00061891
     CC =  +.00042848  C =  +.00025319
                      D =  +.00017528   DD =  +.00029664
                      E =  +.00012155
```

K = +5.50   N = +23

```
                      P =  +.00129132
     AA =  -.00027507  A =  -.00089399
                      B =  +.00061891   BB =  +.00019043
     CC =  -.00013184  C =  -.00042848
                      D =  +.00029664   DD =  +.00009127
                      E =  -.00020536
```

K = +5.50   N = +24

```
                      P =  +.00039735
     AA =  +.00046551  A =  +.00027507
                      B =  +.00019043   BB =  +.00032227
     CC =  +.0002231   C =  +.00013184
                      D =  +.00009127   DD =  +.00015446
                      E =  +.00006318
```

X = +6.50   N = +25

```
                      P =  +.00067240
     AA =  -.00014323  A =  -.00046551
                      B =  +.00032227   BB =  +.00009916
     CC =  -.00006865  C =  -.00022311
                      D =  +.00015446   DD =  +.00004752
                      E =  -.00010693
```

K = +5.50   N = +26

```
                      P =  +.00020669
     AA =  +.00024259  A =  +.00014323
                      B =  +.00009916   BB =  +.00016781
     CC =  +.00011617  C =  +.00006865
                      D =  +.00004752   DD =  +.00008043
                      E =  +.00005290
```

K = +5.50   N = +27

```
                      P =  +.00035012
     AA =  -.00007498  A =  -.00024239
                      B =  +.00016781   BB =  +.00005163
     CC =  -.00003574  C =  -.00011617
                      D =  +.00008043   DD =  +.00002474
                      E =  -.00005568
```

K = +5.50   N = +28

```
                      P =  +.00010775
     AA =  +.00012621  A =  +.00007458
                      B =  +.00005163   BB =  +.00008738
     CC =  +.00006049  C =  +.00003574
                      D =  +.00002474   DD =  +.00004188
                      E =  +.00001713
```

K = +5.50   N = +29

```
                      P =  +.00018231
     AA =  -.00003883  A =  -.00012621
                      B =  +.00008738   BB =  +.00002688
     CC =  -.00001861  C =  -.00006049
                      D =  +.00004188   DD =  +.00001288
                      E =  -.00002899
```

K = +5.50   N = +30

```
                      P =  +.00005609
     AA =  +.00006572  A =  +.00003885
                      B =  +.00002688   BB =  +.00004550
     CC =  +.00005150  C =  +.00001861
                      D =  +.00001288   DD =  +.00002180
                      E =  +.00000892
```

```
K = +6.00    N = +1

  AA = -.34965450    P = +1.71420570
                     A = -1.22446960
                     B = +.67463556    BB = +.24989589
  CC = -.17669705    C = -.62479967
                     D = +.44624262    DD = +.12749789
                     E = -.51074475


K = +6.00    N = +2

  AA = +.59975016    P = +.66979596
                     A = +.34965426
                     B = +.24989590    BB = +.42659297
  CC = +.50599497    C = +.17069707
                     D = +.12749790    DD = +.21656765
                     E = +.09106993


K = +6.00    N = +3

  AA = -.17159717    P = +.65965018
                     A = -.59975012
                     B = +.42659295    BB = +.12239799
  CC = -.06742715    C = -.50599494
                     D = +.21656703    DD = +.06244795
                     E = -.15611960


K = +6.00    N = +4

  AA = +.29375520    P = +.23990008
                     A = +.17159720
                     B = +.12259800    BB = +.20962514
  CC = +.14967509    C = +.06742714
                     D = +.06244795    DD = +.10705364
                     E = +.04460566


K = +6.00    N = +5

  AA = -.08393005    P = +.41125729
                     A = -.29375316
                     B = +.20962513    BB = +.05995004
  CC = -.04202146    C = -.14967509
                     D = +.10705565    DD = +.05056675
                     F = -.07646888
```

```
K = +6.00    N = +6

  AA = +.14388009    P = +.11750206
                     A = +.06393005
                     B = +.05995004    BB = +.10277149
  CC = +.07940621    C = +.04202145
                     D = +.05056675    DD = +.05243443
                     E = +.02184766


K = +6.00    N = +7

  AA = -.04110660    P = +.20145214
                     A = -.14388010
                     B = +.10277150    BB = +.02956329
  CC = -.02097377    C = -.07940821
                     D = +.05243443    DD = +.01496126
                     E = -.05745517


K = +6.00    N = +8

  AA = +.07047190    P = +.05755205
                     A = +.04110861
                     B = +.02936929    BB = +.05053707
  CC = +.05595505    C = +.02097570
                     D = +.01496127    DD = +.02566216
                     E = +.01070090


K = +6.00    N = +9

  AA = -.02013482    P = +.09666065
                     A = -.07047189
                     B = +.05053706    BB = +.01456202
  CC = -.01027267    C = -.03595504
                     D = +.02566217    DD = +.00755776
                     E = -.01634441


K = +6.00    N = +10

  A6 = +.03451664    P = +.02618675
                     A = +.02013482
                     B = +.01430202    6B = +.02465489
  CC = +.01761063    C = +.01027247
                     D = +.00739776    DD = +.01257902
                     E = +.00524126
```

```
K = +6.00    N = +11

  AA = -.00986195    P = +.04692356
                     A = -.03451683
                     B = +.02465487    BB = +.00704425
  CC = -.00503160    C = -.01761062
                     D = +.01257901    DD = +.00359400
                     E = -.00896501


K = +6.00    N = +12

  AA = +.01690620    P = +.01360673
                     A = +.00986195
                     B = +.00704425    BB = +.01207565
  CC = +.00662561    C = +.00503160
                     D = +.00359400    DD = +.00616115
                     E = +.00256714


K = +6.00    N = +13

  AA = -.00465054    P = +.02366869
                     A = -.01690621
                     B = +.01207506    BB = +.00345024
  CC = -.00246446    C = -.00662561
                     D = +.00616115    DD = +.00176033
                     E = -.00440062


K = +6.00    N = +14

  AA = +.00820059    P = +.00676246
                     A = +.00485034
                     B = +.00345024    BB = +.00591470
  CC = +.00422479    C = +.00246446
                     D = +.00176035    DD = +.00301770
                     E = +.00125757


K = +6.00    N = +15

  AA = -.00256566    P = +.01159262
                     A = -.00628056
                     B = +.00591470    BB = +.00166991
  CC = -.00120708    C = -.00422479
                     D = +.00301770    DD = +.00066220
                     E = -.00215550
```

```
K = +6.00    N = +16

                    P =  +.00351223
   AA =  +.00405980  A =  +.00236588
                    B =  +.00168991   BB =  +.00289700
   CC =  +.00206928  C =  +.00120708
                    D =  +.00086220   DD =  +.00147806
                    E =  +.00061585


K = +6.00    N = +17

                    P =  +.00567812
   AA =  -.00115880  A =  -.00405589
                    B =  +.00289700   BB =  +.00082771
   CC =  -.00059122  C =  -.00206928
                    D =  +.00147806   DD =  +.00042230
                    E =  -.00105575


K = +6.00    N = +18

                    P =  +.00162252
   AA =  +.00198651  A =  +.00115880
                    B =  +.00082771   BB =  +.00141894
   CC =  +.00101352  C =  -.00059122
                    D =  +.00042230   DD =  +.00072394
                    E =  +.00030164


K = +6.00    N = +19

                    P =  +.00278112
   AA =  -.00056757  A =  -.00198651
                    B =  +.00141893   BB =  +.00040541
   CC =  -.00028957  C =  -.00101352
                    D =  +.00072394   DD =  +.00020684
                    E =  -.00051710


K = +6.00    N = +20

                    P =  +.00079460
   AA =  +.00097298  A =  +.00056757
                    B =  +.00040541   BB =  +.00069499
   CC =  +.00049642  C =  -.00028957
                    D =  +.00020684   DD =  +.00035458
                    E =  +.00014774


K = +6.00    N = +21

                    P =  +.00138218
   AA =  -.00027799  A =  -.00097298
                    B =  +.00069499   BB =  +.00019856
   CC =  -.00014183  C =  -.00049642
                    D =  +.00035458   DD =  +.00010131
                    E =  -.00025927


K = +6.00    N = +22

                    P =  +.00038919
   AA =  +.00047656  A =  +.00027799
                    B =  +.00019858   BB =  +.00034040
   CC =  +.00024914  C =  +.00014183
                    D =  +.00010131   DD =  +.00017367
                    E =  +.00007236


K = +6.00    N = +23

                    P =  +.00066719
   AA =  -.00019816  A =  -.00047656
                    B =  +.00034040   BB =  +.00009725
   CC =  -.00006947  C =  -.00024314
                    D =  +.00017367   DD =  +.00004962
                    E =  -.00012405


K = +6.00    N = +24

                    P =  +.00019082
   AA =  +.00023941  A =  +.00013616
                    B =  +.00009725   BB =  +.00016672
   CC =  +.00011909  C =  +.00006947
                    D =  +.00004962   DD =  +.00008506
                    E =  +.00003544


K = +6.00    N = +25

                    P =  +.00032678
   AA =  -.00006669  A =  -.00023341
                    B =  +.00016672   BB =  +.00004763
   CC =  -.00003402  C =  -.00011909
                    D =  +.00008506   DD =  +.00002430
                    E =  -.00006076


K = +6.00    N = +26

                    P =  +.00009336
   AA =  +.00011432  A =  +.00006689
                    B =  +.00004763   BB =  -.00008166
   CC =  +.00005853  C =  +.00003402
                    D =  +.00002430   DD =  +.00004166
                    E =  +.00001736


K = +6.00    N = +27

                    P =  +.00016005
   AA =  -.00003266  A =  -.00011432
                    B =  +.00008188   BB =  +.00002333
   CC =  -.00001666  C =  -.00005853
                    D =  +.00004166   DD =  +.00001190
                    E =  -.00002976


K = +6.00    N = +28

                    P =  +.00004575
   AA =  +.00005599  A =  +.00003266
                    B =  +.00002333   BB =  +.00003999
   CC =  +.00002857  C =  +.00001666
                    D =  +.00001190   DD =  +.00002040
                    E =  +.00000850


K = +6.00    N = +29

                    P =  +.00007839
   AA =  -.00001599  A =  -.00005599
                    B =  +.00003999   BB =  +.00001142
   CC =  -.00000816  C =  -.00002857
                    D =  +.00002040   DD =  +.00000583
                    E =  -.00001457


K = +6.00    N = +30

                    P =  +.00002239
   AA =  +.00002742  A =  +.00001599
                    B =  +.00001142   BB =  +.00001959
   CC =  +.00001599  C =  +.00000816
                    D =  +.00000583   DD =  +.00000999
                    E =  +.00000416
```

```
K = +6.50    N = +1
                              P =  +1.73333330
        AA =  -.33894300      A =  -1.27111110
                              B =  +.93214812      BB =  +.24857284
        CC =  -.18228674      C =  -.68397528
                              D =  +.50128654      DD =  +.13367696
                              E =  -.36761158

K = +6.50    N = +2
                              P =  +.46222224
        AA =  +.58753352      A =  +.33896297
                              B =  +.24857285      BB =  -.43085960
        CC =  +.31596370      C =  +.18228675
                              D =  +.13367695      DD =  +.23170671
                              E =  +.09802976

K = +6.50    N = +3
                              P =  +.80118512
        AA =  -.15867820      A =  -.58753575
                              B =  +.43085955      BB =  +.11489589
        CC =  -.08425697      C =  -.31596366
                              D =  +.23170669      DD =  +.06178846
                              E =  -.16991823

K = +8.50    N = +4
                              P =  +.21364938
        AA =  +.27157210      A =  +.15667621
                              B =  +.13489589      BB =  +.19915287
        CC =  +.14604543      C =  -.08425698
                              D =  -.06178845      DD =  +.10709998
                              E =  +.04531153

K = +6.50    N = +5
                              P =  +.37032557
        AA =  -.07241922      A =  -.27157208
                              B =  +.19915286      BB =  +.05310743
        CC =  -.03894545      C =  -.14604543
                              D =  +.10709998      DD =  +.02856000
                              E =  -.07853998
```

```
K = +6.50    N = +6
                              P =  +.09875349
        AA =  +.12552445      A =  +.07241922
                              B =  +.05310743      BB =  +.09205268
        CC =  +.06750544      C =  +.03894545
                              D =  +.02855999      DD =  +.04950399
                              E =  +.02094399

K = +6.50    N = +7
                              P =  +.17117272
        AA =  -.03347378      A =  -.12552666
                              B =  +.09205286      BB =  +.02454743
        CC =  -.01800145      C =  -.06750544
                              D =  +.04950399      DD =  +.01320106
                              E =  -.03630292

K = +6.50    N = +8
                              P =  +.04564607
        AA =  +.09802123      A =  +.03347378
                              B =  +.02454744      BB =  -.04254890
        CC =  +.03120252      C =  +.01800145
                              D =  +.01320107      DD =  +.02288185
                              E =  +.00968078

K = +6.50    N = +9
                              P =  +.07911984
        AA =  -.01547232      A =  -.05802122
                              B =  +.04254889      BB =  +.01134637
        CC =  -.00832067      C =  -.03120252
                              D =  +.02288185      DD =  +.00610182
                              E =  -.01678002

K = +6.50    N = +10
                              P =  +.02109862
        AA =  +.02681869      A =  +.01547232
                              B =  +.01134636      BB =  +.01966703
        CC =  +.0144224       C =  +.00832067
                              D =  +.00610182      DD =  +.01057649
                              E =  +.00447467
```

```
K = +6.50    N = +11
                              P =  +.03657095
        AA =  -.00715165      A =  -.02681869
                              B =  +.01966704      BB =  +.00524454
        CC =  -.00384800      C =  -.01442250
                              D =  +.01057650      DD =  +.00282040
                              E =  -.00775609

K = +6.50    N = +12
                              P =  +.00975225
        AA =  +.01239619      A =  +.00715165
                              B =  +.00524454      BB =  +.00909054
        CC =  +.00666639      C =  +.00384599
                              D =  +.00282039      DD =  +.00488869
                              E =  +.00206829

K = +6.50    N = +13
                              P =  +.01690391
        AA =  -.00330565      A =  -.01239620
                              B =  +.00909054      BB =  +.00242414
        CC =  -.00177770      C =  -.00666640
                              D =  +.00488886      DD =  +.00130365
                              E =  -.00398504

K = +6.50    N = +14
                              P =  +.00450771
        AA =  +.00572980      A =  +.00330565
                              B =  +.00242414      BB =  +.00420185
        CC =  +.00308135      C =  +.00177770
                              D =  +.00130365      DD =  +.00225966
                              E =  +.00095801

K = +6.50    N = +15
                              P =  +.00781336
        AA =  -.00152794      A =  -.00572979
                              B =  +.00420185      BB =  +.00112049
        CC =  -.00082169      C =  -.00308135
                              D =  -.00225966      DD =  +.00060257
                              E =  -.00165708
```

K = +6.50   N = +16

```
                    P =  +.00208356
    AA =  +.00264843    A =  +.00152794
                    B =  +.00112049    BB =  +.00194218
    CC =  +.00142427    C =  +.00062169
                    D =  +.00060257    DD =  +.00104446
                    E =  +.00044188
```

K = +6.50   N = +17

```
                    P =  +.00361150
    AA =  -.00070625    A =  -.00264843
                    B =  +.00194218    BB =  +.00051791
    CC =  -.00037980    C =  -.00142427
                    D =  +.00104446    DD =  +.00027852
                    E =  -.00076594
```

K = +6.50   N = +18

```
                    P =  +.00096306
    AA =  +.00122416    A =  +.00070625
                    B =  +.00051791    BB =  +.00089772
    CC =  +.00065833    C =  +.00037980
                    D =  +.00027852    DD =  +.00048277
                    E =  +.00020429
```

K = +6.50   N = +19

```
                    P =  +.00166931
    AA =  -.00032644    A =  +.00122416
                    B =  +.00089772    BB =  +.00023939
    CC =  -.00017555    C =  -.00065833
                    D =  +.00048277    DD =  +.00012874
                    E =  -.00035405
```

K = +6.50   N = +20

```
                    P =  +.00044515
    AA =  +.00056583    A =  +.00032644
                    B =  +.00023939    DB =  +.00041494
    CC =  +.00030429    C =  +.00017555
                    D =  +.00012874    DO =  +.00022314
                    E =  +.00009440
```

K = +6.50   N = +21

```
                    P =  +.00077159
    AA =  -.00015088    A =  -.00056583
                    B =  +.00041494    BB =  +.00011065
    CC =  -.00008114    C =  -.00030429
                    D =  +.00022314    DD =  +.00005950
                    E =  -.00016364
```

K = +6.50   N = +22

```
                    P =  +.00020575
    AA =  +.00026154    A =  +.00015088
                    B =  +.00011065    BB =  +.00019179
    CC =  +.00014065    C =  +.00008114
                    D =  +.00005950    DD =  +.00010314
                    E =  +.00004363
```

K = +6.50   N = +23

```
                    P =  +.00035664
    AA =  -.00006974    A =  -.00026154
                    B =  +.00019179    BB =  +.00005114
    CC =  -.00003750    C =  -.00014065
                    D =  +.00010314    DD =  -.00002750
                    E =  -.00007563
```

K = +6.50   N = +24

```
                    P =  +.00009510
    AA =  +.00012089    A =  +.00006974
                    B =  +.00005114    BB =  +.00008765
    CC =  +.00006501    C =  +.00003750
                    D =  +.00002750    DD =  +.00004767
                    E =  +.00002017
```

K = +6.50   N = +25

```
                    P =  +.00016485
    AA =  -.00003223    A =  -.00012089
                    B =  +.00008865    BB =  +.00002364
    CC =  +.00001733    C =  -.00006501
                    D =  +.00004767    DD =  +.00001271
                    E =  -.00003496
```

K = +6.50   N = +26

```
                    P =  +.00004396
    AA =  +.00005587    A =  +.00003223
                    B =  +.00002364    BB =  +.00004097
    CC =  +.00003005    C =  +.00001733
                    D =  +.00001271    DD =  +.00002203
                    E =  +.00000932
```

K = +6.50   N = +27

```
                    P =  +.00007619
    AA =  -.00001490    A =  -.00005587
                    B =  +.00004097    BB =  +.00001892
    CC =  -.00000801    C =  -.00003005
                    D =  +.00002203    DD =  +.00000587
                    E =  -.00001616
```

K = +6.50   N = +28

```
                    P =  +.00002031
    AA =  +.00002582    A =  +.00001490
                    B =  +.00001092    BB =  +.00001894
    CC =  +.00001388    C =  +.00000801
                    D =  +.00000587    DD =  +.00001018
                    E =  +.00000430
```

K = +6.50   N = +29

```
                    P =  +.00003522
    AA =  -.00000688    A =  -.00002582
                    B =  +.00001894    BB =  +.00000505
    CC =  -.00000370    C =  -.00001388
                    D =  +.00001018    DD =  +.00000271
                    E =  -.00000746
```

K = +6.50   N = +30

```
                    P =  +.00000939
    AA =  +.00001193    A =  +.00000688
                    B =  +.00000505    BB =  -.00000875
    CC =  -.00000642    C =  +.00000370
                    D =  +.00000271    DD =  +.00000470
                    E =  +.00000199
```

```
K = +7.00    N = +1
                        P = +1.75000000
    AA = -.52812500     A = -1.31250000
                        B = +.98437500    BB = +.24609575
    CC = -.18457031     C = -.73828125
                        O = +.55371094    OO = +.13842775
                        E = -.41528321

K = +7.00    N = +2
                        P = +.43750005
    AA = +.57421882     A = +.32812504
                        B = +.24609378    BB = -.43066411
    CC = +.32299806     C = +.18457033
                        O = +.13842775    DD = +.24224856
                        E = +.10382081

K = +7.00    N = +3
                        P = +.76562505
    AA = -.14355470     A = -.57421879
                        B = +.43066409    BB = +.10766602
    CC = -.08074952     C = -.32299807
                        O = +.24224855    DD = +.06056215
                        E = -.18160642

K = +7.00    N = +4
                        P = +.19140628
    AA = +.25122074     A = +.14355471
                        B = +.10766603    BB = +.18041553
    CC = +.14131166     C = -.08074952
                        O = +.06056214    OO = +.10598375
                        E = +.04542160

K = +7.00    N = +5
                        P = +.33496101
    AA = -.06280519     A = -.25122076
                        B = +.18841557    BB = +.04710389
    CC = -.03532792     C = -.14131168
                        O = +.10598576    DD = +.02649595
                        E = -.07948781

K = +7.00    N = +6
                        P = +.08574025
    AA = +.10990908     A = +.06280518
                        B = +.04710389    BB = +.08243181
    CC = +.06182585     C = +.03552791
                        O = +.02649593    OO = +.04636789
                        E = +.01987195

K = +7.00    N = +7
                        P = +.14654545
    AA = -.02747728     A = -.10990909
                        B = +.08243181    BB = +.02060795
    CC = -.01545596     C = -.06182386
                        D = +.04636789    DD = +.01159197
                        E = -.03477592

K = +7.00    N = +8
                        P = +.05663637
    AA = +.04608524     A = +.02747728
                        B = +.02060796    BB = -.03606593
    CC = +.02704794     C = +.01545597
                        O = +.01159197    DD = +.02028596
                        E = +.00869398

K = +7.00    N = +9
                        P = +.06411361
    AA = -.01202130     A = -.04808521
                        B = +.05606590    BB = +.00901597
    CC = -.00676198     C = -.02704793
                        D = +.02028594    DD = +.00507148
                        E = -.01521446

K = +7.00    N = +10
                        P = +.01602841
    AA = +.02103728     A = +.01202130
                        B = +.00901598    BB = +.01577796
    CC = +.01185347     C = +.00676198
                        O = +.00507148    DD = +.00887510
                        E = +.00380361

K = +7.00    N = +11
                        P = +.02804973
    AA = -.00525932     A = -.02103730
                        B = +.01577797    BB = +.00394449
    CC = -.00295837     C = -.0118354
                        O = +.00887511    DD = +.00221877
                        E = -.00665633

K = +7.00    N = +12
                        P = +.00701242
    AA = +.00920381     A = +.00525952
                        B = +.00394449    BB = +.00690286
    CC = +.00517714     C = +.00295836
                        O = +.00221877    OO = +.00388285
                        E = +.0016640

K = +7.00    N = +13
                        P = +.01227175
    AA = -.00230095     A = -.00920381
                        B = +.00690286    BB = +.00172571
    CC = -.00129428     C = -.00517714
                        D = +.00388285    OO = +.00097071
                        E = -.00291214

K = +7.00    N = +14
                        P = +.00306793
    AA = +.00402667     A = +.00230095
                        B = +.00172571    BB = +.00302000
    CC = +.00226500     C = +.00129428
                        D = +.00097071    DD = +.00169875
                        E = +.00072803

K = +7.00    N = +15
                        P = +.00536889
    AA = -.00100666     A = -.00402666
                        B = +.00502000    BB = +.00075500
    CC = -.00056625     C = -.00226500
                        O = +.00169875    DD = +.00042468
                        E = -.00127406
```

```
K = +7.00    N = +16
                          P =  +.00134222
      AA =  +.00176166    A =  +.00100666
                          B =  +.00075500   BB =  +.00132125
      CC =  +.00099093    C =  +.00056625
                          D =  +.00042468   DD =  +.00074320
                          E =  +.00031851


K = +7.00    N = +17
                          P =  +.00234889
      AA =  -.00044041    A =  -.00176166
                          B =  +.00132125   BB =  +.00033031
      CC =  -.00024773    C =  -.00099093
                          D =  +.00074320   DD =  +.00018580
                          E =  -.00055740


K = +7.00    N = +18
                          P =  +.00058722
      AA =  +.00077073    A =  +.00044041
                          B =  +.00033031   BB =  +.00057804
      CC =  +.00043353    C =  +.00024773
                          O =  +.00018580   DD =  +.00032515
                          F =  +.00013935


K = +7.00    N = +19
                          P =  +.00102763
      AA =  -.00019268    A =  -.00077072
                          B =  +.00057804   BB =  +.00014451
      CC =  -.00010838    C =  -.00043353
                          O =  +.00032515   DD =  +.00008128
                          E =  -.00024386


K = +7.00    N = +20
                          P =  +.00025690
      AA =  +.00033719    A =  +.00019268
                          B =  +.00014451   BB =  +.00025289
      CC =  +.00018967    C =  +.00010838
                          D =  +.00008128   DD =  +.00014225
                          E =  +.00006096
```

```
K = +7.00    N = +21
                          P =  +.00044959
      AA =  -.00008429    A =  -.00033719
                          B =  +.00025289   BB =  +.00006322
      CC =  -.00004741    C =  -.00018967
                          D =  +.00014225   DD =  +.00003556
                          E =  -.0001066


K = +7.00    N = +22
                          P =  +.00011239
      AA =  +.00014752    A =  +.00008429
                          B =  +.00006322   BB =  +.00011064
      CC =  +.00008298    C =  +.00004741
                          D =  +.00003556   DD =  +.00006223
                          E =  +.00002667


K = +7.00    N = +23
                          P =  +.00019669
      AA =  -.00003688    A =  -.00014752
                          B =  +.00011064   BB =  +.00002766
      CC =  -.00002074    C =  -.00008298
                          O =  +.00006223   DD =  +.00001555
                          E =  -.00004667


K = +7.00    N = +24
                          P =  +.00004917
      AA =  +.00006454    A =  +.00003688
                          B =  +.00002766   BB =  +.00004840
      CC =  +.00003630    C =  +.00002074
                          D =  +.00001555   DD =  +.00002722
                          E =  +.00001166


K = +7.00    N = +25
                          P =  +.00008605
      AA =  -.00001613    A =  -.00006454
                          B =  +.00004840   BB =  +.00001210
      CC =  -.00000907    C =  -.00003630
                          D =  +.00002722   DD =  +.00000680
                          E =  -.00002042
```

```
K = +7.00    N = +26
                          P =  +.00002151
      AA =  +.00002823    A =  +.00001613
                          B =  +.00001210   BD =  +.00002117
      CC =  +.00001588    C =  +.00000907
                          D =  +.00000680   DD =  +.00001191
                          E =  +.00000510


K = +7.00    N = +27
                          P =  +.00003764
      AA =  -.00000705    A =  -.00002823
                          B =  +.00002117   BM =  +.00000529
      CC =  -.00000397    C =  -.00001588
                          D =  +.00001191   DD =  +.00000297
                          E =  -.00000893


K = +7.00    N = +28
                          P =  +.00000941
      AA =  +.00001235    A =  +.00000705
                          B =  +.00000529   BB =  +.00000926
      CC =  +.00000694    C =  +.00000397
                          O =  +.00000297   DD =  +.00000521
                          E =  +.00000223


K = +7.00    N = +29
                          P =  -.00001647
      AA =  -.00000308    A =  -.00001235
                          B =  +.00000926   BB =  +.00000231
      CC =  -.00000173    C =  -.00000694
                          D =  +.00000521   DD =  +.00000130
                          E =  -.00000390


K = +7.00    N = +30
                          P =  +.00000411
      AA =  +.00000540    A =  +.00000308
                          B =  +.00000231   BB =  +.00000405
      CC =  +.00000304    C =  +.00000173
                          D =  +.00000130   DD =  +.00000228
                          E =  +.00000097
```

```
K = +7.50    N = +1
                          P =  +1.76470580
   AA =  -.31752490       A =  -1.54948090
                          B =  +1.03195600    BB =  +.24201320
   CC =  -.18540047       C =   -.78914260
                          D =   +.60346213    DD =  +.14199109
                          E =   -.48147104


K = +7.50    N = +2
                          P =   +.41522489
   AA =  +.96033808       A =   +.31752491
                          B =   +.24281317    BB =  +.42849383
   CC =  -.32767175       C =   +.18568066
                          D =   +.14199309    DD =  +.25057251
                          E =   +.10858142


K = +7.50    N = +3
                          P =   +.73274975
   AA =  -.13184425       A =   -.56093804
                          B =   -.42849379    BB =  +.10082207
   CC =  -.07708923       C =   -.32767172
                          D =   +.25057249    DD =  +.05895823
                          E =   -.19161476


K = +7.50    N = +4
                          P =   +.17241171
   AA =  +.23266612       A =   +.13184425
                          B =   +.10082207    BB =  +.17792150
   CC =  +.13605746       C =   +.07708923
                          D =   +.05895823    DD =  +.10404394
                          E =   +.04908570


K = +7.50    N = +5
                          P =   +.30423595
   AA =  -.05474501       A =   -.23266631
                          B =   +.17792150    BB =  +.04186384
   CC =  -.03201352       C =   -.13605746
                          D =   +.10404394    DD =  +.02448093
                          E =   -.07956301
```

```
K = +7.50    N = +6
                          P =   +.07158963
   AA =  +.09660884       A =   +.05474501
                          B =   +.04186383    BB =  +.07387735
   CC =  +.05649444       C =   +.03201351
                          D =   +.02448092    DD =  +.04320163
                          E =   +.01872070


K = +7.50    N = +7
                          P =   -.12653464
   AA =  -.02273149       A =   -.09660884
                          B =   +.07387735    BB =  +.01738290
   CC =  -.01329281       C =   -.05649444
                          D =   +.04320163    DD =  +.01016909
                          E =   -.03303654


K = +7.50    N = +8
                          P =   +.02932579
   AA =  +.04011439       A =   +.02273149
                          B =   +.01738290    BB =  +.03067571
   CC =  +.02345790       C =   +.01529261
                          D =   +.01016509    DD =  +.01793839
                          E =   +.00777330


K = +7.50    N = +9
                          P =   +.05245728
   AA =  -.00943868       A =   -.04011439
                          B =   -.03067571    BB =  +.00721781
   CC =  -.00551950       C =   -.02345789
                          D =   +.01793839    DD =  +.00422079
                          E =   -.01371759


K = +7.50    N = +10
                          P =   +.01234289
   AA =  +.01665649       A =   +.00943868
                          B =   +.00721781    BB =  -.01273732
   CC =  +.00974030       C =   +.00551950
                          D =   +.00422079    DD =  +.00744846
                          E =   +.00322766
```

```
K = +7.50    N = +11
                          P =   +.02178157
   AA =  -.00391917       A =   -.01665649
                          B =   +.01273731    BB =  +.00299701
   CC =  -.00229183       C =   -.00974030
                          D =   +.00744846    DD =  +.00175258
                          E =   -.00569568


K = +7.50    N = +12
                          P =   +.00512507
   AA =  +.00691619       A =   +.00391917
                          B =   +.00299701    BB =  +.00528865
   CC =  +.00404441       C =   +.00229183
                          D =   +.00175258    DD =  +.00309278
                          E =   +.00134020


K = +7.50    N = +13
                          P =   +.00904425
   AA =  -.00162733       A =   -.00691619
                          B =   +.00528865    BB =  +.00124443
   CC =  -.00095162       C =   -.00404441
                          D =   +.00309278    DD =  +.00072771
                          E =   -.00236507


K = +7.50    N = +14
                          P =   +.00212605
   AA =  +.00287177       A =   +.00162733
                          B =   +.00124443    BB =  +.00219606
   CC =  +.00167934       C =   +.00095162
                          D =   +.00072771    DD =  +.00128420
                          E =   +.00055648


K = +7.50    N = +15
                          P =   +.00375539
   AA =  -.00067571       A =   -.00287177
                          B =   +.00219606    BB =  +.00051672
   CC =  -.00039515       C =   -.00167934
                          D =   +.00128420    DD =  +.00030216
                          E =   -.00098203
```

```
K =  +7.50     N = +16

     AA =  +.00119243        P =  +.00088362
                             A =  +.00067571
                             B =  +.00051872     BB =  +.00091186
     CC =  +.00069730        C =  +.00039513
                             D =  +.00030216     DD =  +.00053323
                             E =  +.00023106


K =  +7.50     N = +17

     AA =  -.00028057        P =  +.00155933
                             A =  -.00119243
                             B =  +.00091186     BB =  +.00021455
     CC =  -.00016407        C =  -.0006 730
                             D =  +.00053323     DD =  +.00012546
                             E =  -.00040776


K =  +7.50     N = +18

     AA =  +.00049512        P =  +.00036690
                             A =  +.00028057
                             B =  +.00021455     BB =  +.00057862
     CC =  +.00028953        C =  +.00016407
                             D =  +.00012546     DD =  +.00022141
                             E =  +.00009594


K =  +7.50     N = +19

     AA =  -.00011650        P =  +.00064747
                             A =  -.00049512
                             B =  +.00037862     BB =  +.00008908
     CC =  -.00006812        C =  -.00028953
                             D =  +.00022141     DD =  +.00005209
                             E =  -.00016931


K =  +7.50     N = +20

     AA =  +.00020558        P =  +.00015234
                             A =  +.00011650
                             B =  +.00008908     BB =  +.00015721
     CC =  +.00012022        C =  +.00006812
                             D =  +.00005209     DD =  +.00009193
                             E =  +.00003983


K =  +7.50     N = +21

     AA =  -.00004837        P =  +.00026884
                             A =  -.00020558
                             B =  +.00015721     BB =  +.00003699
     CC =  -.00002828        C =  -.00012022
                             D =  +.00009193     DD =  +.00002163
                             E =  -.00007030


K =  +7.50     N = +22

     AA =  +.00008536        P =  +.00006325
                             A =  +.00004837
                             B =  +.00003699     BB =  +.00006527
     CC =  +.00004991        C =  +.0000282
                             D =  +.00002163     DD =  +.00003817
                             E =  +.00001654


K =  +7.50     N = +23

     AA =  -.00002008        P =  +.00011169
                             A =  -.00008536
                             B =  +.00006527     BB =  +.00001535
     CC =  -.00001174        C =  -.00004991
                             D =  +.00003817     DD =  +.00000898
                             E =  -.0000291


K =  +7.50     N = +24

     AA =  +.00003544        P =  +.00002626
                             A =  +.00002008
                             B =  +.00001535     BB =  +.00002710
     CC =  +.00002072        C =  +.00001174
                             D =  +.00000898     DD =  +.00001585
                             E =  +.00000686


K =  +7.50     N = +25

     AA =  -.00000834        P =  +.00004635
                             A =  -.00003544
                             B =  +.00002710     BB =  +.00000637
     CC =  -.00000487        C =  -.00002072
                             D =  +.00001585     DD =  +.00000372
                             E =  -.00001212


K =  +7.50     N = +26

     AA =  -.00001471        P =  +.00001090
                             A =  +.00000634
                             B =  +.00000637     BB =  +.00001125
     CC =  +.00000860        C =  +.0000048
                             D =  +.00000372     DD =  +.00000658
                             E =  +.00000285


K =  +7.50     N = +27

     AA =  -.00000346        P =  +.00001924
                             A =  -.00001471
                             B =  +.00001125     BB =  +.00000264
     CC =  -.00000202        C =  -.00000860
                             D =  +.00000658     DD =  +.00000154
                             E =  -.00000503


K =  +7.50     N = +28

     AA =  +.00000611        P =  +.00000452
                             A =  +.00000346
                             B =  +.00000264     BB =  +.00000467
     CC =  +.00000357        C =  +.00000202
                             D =  +.00000154     DD =  +.00000273
                             E =  +.00000118


K =  +7.50     N = +29

     AA =  -.00000143        P =  +.00000799
                             A =  -.00000611
                             B =  +.00000467     BB =  +.00000109
     CC =  -.00000084        C =  -.00000357
                             D =  +.00000273     DD =  +.00000064
                             E =  -.00000206


K =  +7.50     N = +30

     AA =  +.00000283        P =  +.00000188
                             A =  +.00000143
                             B =  +.00000109     BB =  +.00000194
     CC =  +.00000148        C =  +.00000084
                             D =  +.00000064     DD =  +.00000113
                             E =  +.00000049
```

```
K = +8.00     N = +1
                          P =  +1.77777760
    AA =  -.30727020      A =  -1.38271590
                          B =  +1.07544570    BB =  +.23898800
    CC =  -.18587950      C =   -.63645775
                          D =   +.65057825    DD =  +.14457295
                          E =   -.50600530

K = +8.00     N = +2
                          P =   +.39506172
    AA =  +.54625817      A =   -.30727022
                          B =   +.23898795    BB =  +.42486746
    CC =  +.33045246      C =   -.18587951
                          D =   +.14457295    DD =  +.25701858
                          E =   +.11244563

K = +8.00     N = +3
                          P =   +.70233190
    AA =  -.12139070      A =   -.54625814
                          B =   +.42486744    BB =  -.09441499
    CC =  -.07343388      C =   -.33045245
                          D =   +.25701857    DD =  -.05711524
                          E =   -.19990333

K = +8.00     N = +4
                          P =   +.15607376
    AA =  +.21580568      A =   +.12139070
                          B =   +.09441498    BB =  +.16784886
    CC =  +.13054911      C =   +.07343387
                          D =   +.05711523    DD =  -.10153820
                          E =   +.04442294

K = +8.00     N = +5
                          P =   +.27746445
    AA =  -.04795682      A =   -.21580568
                          B =   +.16784886    BB =  +.03729975
    CC =  -.02901093      C =   -.13054911
                          D =   +.10153820    DD =  +.02256405
                          E =   -.07897415
```

```
K = +8.00     N = +6
                          P =   +.06165876
    AA =  +.08525656      A =   +.04795681
                          B =   +.03729974    BB =  +.06631065
    CC =  +.05157499      C =   +.02901091
                          D =   +.02256404    DD =  +.04011585
                          E =   +.01754981

K = +8.00     N = +7
                          P =   +.10961555
    AA =  -.01896589      A =   -.08525653
                          B =   +.06631064    BB =  +.01473589
    CC =  -.01146109      C =   -.05157494
                          D =   +.04011384    DD =  +.00891418
                          E =   -.03119965

K = +8.00     N = +8
                          P =   +.02435902
    AA =  +.03368161      A =   +.01894590
                          B =   +.01473570    BB =  +.02619680
    CC =  +.02037529      C =   +.01146110
                          D =   +.00891419    DD =  +.01584745
                          E =   +.00693326

K = +8.00     N = +9
                          P =   +.04330491
    AA =  -.00748480      A =   -.03368160
                          B =   +.02619680    BB =  +.00582191
    CC =  -.00452784      C =   -.02037529
                          D =   +.01584744    DD =  +.00352165
                          E =   -.01232579

K = +8.00     N = +10
                          P =   +.00962331
    AA =  +.01330631      A =   +.00748480
                          B =   +.00582151    BB =  +.01034935
    CC =  +.00804950      C =   +.00452784
                          D =   +.00352165    DD =  +.00626072
                          E =   +.00273906
```

```
K = +8.00     N = +11
                          P =   +.01710812
    AA =  -.00295695      A =   -.01330631
                          B =   +.01034935    BB =  -.00229985
    CC =  -.00178877      C =   -.00804949
                          D =   +.00626072    DD =  +.00139127
                          E =   -.00486945

K = +8.00     N = +12
                          P =   +.00380180
    AA =  +.00525881      A =   +.00295695
                          B =   +.00229985    BB =  +.00408863
    CC =  +.00318004      C =   +.00178877
                          D =   +.00139127    DD =  +.00247337
                          E =   +.00108209

K = +8.00     N = +13
                          P =   +.00675876
    AA =  -.00116818      A =   -.00525881
                          B =   +.00408863    BB =  +.00090858
    CC =  -.00070667      C =   -.00118005
                          D =   +.00247337    DD =  +.00054963
                          E =   -.00192371

K = +8.00     N = +14
                          P =   +.00150194
    AA =  +.00207676      A =   +.00116818
                          B =   +.00090858    BB =  +.00161526
    CC =  +.00125631      C =   +.00070667
                          D =   +.00054963    DD =  +.00097713
                          E =   +.00042749

K = +8.00     N = +15
                          P =   +.00267012
    AA =  -.00046150      A =   -.00207676
                          B =   +.00161526    BB =  +.00035894
    CC =  -.00027918      C =   -.00125631
                          D =   +.00097713    DD =  +.00021714
                          E =   -.00075999
```

K = +8.00   N = +16

AA = +.00082045   P = +.00059336
                    A = +.00046150
                    B = +.00035094   BB = +.00063812
CC = +.00049632   C = +.00027918
                    D = +.00021714   DD = +.00038602
                    E = +.00016888

K = +8.00   N = +17

AA = -.00018232   P = +.00109486
                    A = -.00082045
                    B = +.00063812   BB = +.00016180
CC = -.00011029   C = -.00049632
                    D = +.00038602   DD = +.00008578
                    E = -.00030024

K = +8.00   N = +18

AA = +.00032412   P = +.00023441
                    A = +.00018232
                    B = +.00014180   BB = +.00024210
CC = +.00019607   C = +.00011029
                    D = +.00008578   DD = +.00014250
                    E = +.00006672

K = +8.00   N = +19

AA = -.00007202   P = +.00041673
                    A = -.00032412
                    B = +.00075209   BB = +.00005602
CC = -.00004357   C = -.00019607
                    D = +.00015250   DD = +.00003388
                    E = -.00011861

K = +8.00   N = +20

AA = +.00012805   P = +.00009260
                    A = +.00007202
                    B = +.00005602   BB = +.00009959
CC = +.00007746   C = +.00004357
                    D = +.00001388   DD = +.00006024
                    E = +.00002635

K = +8.00   N = +21

AA = -.00002845   P = +.00016463
                    A = -.00012805
                    B = +.00009959   BB = +.00002213
CC = -.00001721   C = -.00007746
                    D = +.00006024   DD = +.00001338
                    E = -.00004686

K = +8.00   N = +22

AA = +.00005058   P = +.00003858
                    A = +.00002845
                    B = +.00002213   BB = +.00003934
CC = +.00003060   C = +.00001721
                    D = +.00001338   DD = +.00002380
                    E = +.00001041

K = +8.00   N = +23

AA = -.00001124   P = +.00006504
                    A = -.00005058
                    B = +.00003934   BB = +.00000874
CC = -.00000680   C = -.00003060
                    D = +.00002380   DD = +.00000528
                    E = -.00001851

K = +8.00   N = +24

AA = +.00001998   P = +.00001445
                    A = +.00001124
                    B = +.00000874   BB = +.00001554
CC = +.00001208   C = +.00000680
                    D = +.00000528   DD = +.00000940
                    E = +.00000411

K = +8.00   N = +25

AA = -.00000444   P = +.00002569
                    A = -.00001998
                    B = +.00001554   BB = +.00000345
CC = -.00000268   C = -.00001208
                    D = +.00000940   DD = +.00000208
                    E = -.00000731

K = +8.00   N = +26

AA = +.00000789   P = +.00000571
                    A = +.00000444
                    B = +.00000345   BB = -.00000614
CC = +.00000477   C = +.00000268
                    D = +.00000208   DD = +.00000371
                    E = +.00000162

K = +8.00   N = +27

AA = -.00000175   P = +.00001015
                    A = -.00000789
                    B = +.00000614   BB = +.00000136
CC = -.00000106   C = -.00000477
                    D = +.00000371   DD = +.00000082
                    E = -.00000288

K = +8.00   N = +28

AA = +.00000311   P = +.00000225
                    A = +.00000175
                    B = +.00000136   BB = +.00000242
CC = +.00000188   C = +.00000106
                    D = +.00000082   DD = +.00000146
                    E = +.00000064

K = +8.00   N = +29

AA = -.00000069   P = +.00000401
                    A = -.00000311
                    B = +.00000242   BB = +.00000053
CC = -.00000041   C = -.00000188
                    D = +.00000146   DD = +.00000032
                    E = -.00000114

K = +8.00   N = +30

AA = +.00000123   P = +.00000089
                    A = +.00000069
                    B = +.00000053   BB = +.00000095
CC = +.00000074   C = +.00000041
                    D = +.00000032   DD = +.00000057
                    E = +.00000025

```
K = +8.50    N = +1
                         P  = +1.78947360
    AA = -.29741940      A  = -1.41274230
                         B  = +1.11532290    BB = +.23480490
    CC = -.18537223      C  = -.88051805
                         D  = +.69514582     DD = +.14654650
                         E  = -.54879952

K = +8.50    N = +2
                         P  = +.37673130
    AA = +.55222427      A  = +.29741945
                         B  = +.23480482     BB = +.42017705
    CC = +.33171872      C  = +.18537223
                         D  = +.1465464      DD = +.26198319
                         E  = +.11553670

K = +8.50    N = +3
                         P  = +.67415075
    4A = -.11204722      4  = -.55222427
                         B  = +.42017705     BB = +.08845832
    CC = -.06985553      C  = -.33171873
                         O  = +.26180320     OO = +.05513331
                         E  = -.20674989

K = +8.50    N = +4
                         P  = +.14192646
    AA = +.20050551      A  = +.11204720
                         B  = -.08845831     BB = +.15029383
    CC = +.12496881      C  = +.06985551
                         D  = +.05513330     DD = +.09865958
                         E  = +.04752628

K = +8.50    N = +5
                         P  = +.25397367
    AA = -.04221169      A  = -.20050553
                         B  = +.15829384     BB = +.03352502
    CC = -.02650923      C  = -.12496882
                         O  = +.09865959     DD = +.02077044
                         E  = -.07788915


K = +8.50    N = +6
                         P  = +.05346814
    AA = +.07553671      A  = +.04221169
                         B  = +.03332501     BB = +.05963424
    CC = +.04707966      C  = +.02630922
                         D  = +.02077044     DD = +.03716815
                         E  = +.01639771

K = +8.50    N = +7
                         P  = +.09967984
    AA = -.01590246      A  = -.07553672
                         B  = +.05963425     BB = +.01255458
    CC = -.00991151      C  = -.04707967
                         D  = +.03716816     DD = +.00782487
                         E  = -.02984328

K = +8.50    N = +8
                         P  = +.02014311
    AA = +.02845703      A  = +.01590246
                         B  = +.01255457     BB = +.02246608
    CC = +.01773697      C  = +.00991150
                         D  = +.00782487     DD = +.01400240
                         E  = +.00617753

K = +8.50    N = +9
                         P  = +.03604561
    AA = -.00599096      4  = -.02845706
                         B  = +.02246610     BB = +.00472970
    CC = -.00373397      C  = -.01773639
                         D  = +.01400242     DD = +.00294787
                         E  = -.01105454

K = +8.50    N = +10
                         P  = +.00758054
    AA = +.01072066      A  = +.00599095
                         B  = +.00472970     BB = +.00846368
    CC = +.00668185      C  = +.00373397
                         D  = +.00294787     DD = +.00527514
                         E  = +.00232727


K = +8.50    N = +11
                         P  = +.01357949
    AA = -.00225698      A  = -.01072065
                         B  = +.00846367     BB = +.00178182
    CC = -.00140670      C  = -.00668184
                         D  = +.00527514     DD = +.00111055
                         E  = -.00416458

K = +8.50    N = +12
                         P  = +.00205884
    AA = +.00403880      A  = +.00225698
                         B  = +.00178182     BB = +.00318853
    CC = +.00251726      C  = +.00140670
                         D  = +.00111055     DD = +.00198731
                         E  = +.00087675

K = +8.50    N = +13
                         P  = +.00511582
    AA = -.00085027      A  = -.00403880
                         B  = +.00318853     BB = +.00067126
    CC = -.00052995      C  = -.00251726
                         O  = +.00198751     DD = +.00041838
                         E  = -.00156893

K = +8.50    N = +14
                         P  = +.00107701
    AA = +.00152154      A  = +.00085027
                         B  = +.00067127     BB = +.00120122
    CC = +.00094833      C  = +.00052995
                         O  = +.00041838     OO = +.00074868
                         E  = +.00053030

K = +8.50    N = +15
                         P  = +.00192729
    AA = -.00032032      A  = -.00152154
                         B  = +.00120122     BB = +.00025288
    CC = -.00019964      C  = -.00094833
                         D  = +.00074868     DD = +.00015761
                         E  = -.00059106
```

```
K = +8.50    N = +16
                          P =   +.00040574
   AA =  +.00057321       A =   +.00032032
                          B =   +.00025288    BB =   +.00045253
   CC =  +.00035726       C =   +.00019964
                          D =   +.00015761    DD =   +.00028205
                          E =   +.00012443

K = +8.50    N = +17
                          P =   +C00072607
   AA =  -.00012067       A =   -.00057321
                          B =   +.00045253    BB =   +.00009527
   CC =  -.00007521       C =   -.00035726
                          D =   +.00028205    DD =   +.00005937
                          E =   +.00022267

K = +8.50    N = +18
                          P =   +.00019285
   AA =  +.00021994       A =   +.00012067
                          B =   +.00009527    BB =   +.00017048
   CC =  +.00013459       C =   +.00007521
                          D =   +.00005937    DD =   +.00010625
                          E =   +.00004687

K = +8.50    N = +19
                          P =   +.00027353
   AA =  -.00004546       A =   -.00021594
                          B =   +.00017048    BB =   +.00003589
   CC =  -.00002853       C =   -.00013459
                          D =   +.00010625    DD =   +.00002237
                          E =   -.00008388

K = +8.50    N = +20
                          P =   +.00005758
   AA =  +.00008135       A =   +.00004546
                          B =   +.00003589    BB =   +.00006422
   CC =  +.00005070       C =   +.00002853
                          D =   +.00002237    DD =   +.00004003
                          E =   +.00001766


K = +8.50    N = +21
                          P =   +.00010304
   AA =  -.00001712       A =   -.00008135
                          B =   +.00006422    BB =   +.00001352
   CC =  -.00001067       C =   -.00005070
                          D =   +.00004003    DD =   +.00000842
                          E =   -.00003160

K = +8.50    N = +22
                          P =   +.00002169
   AA =  +.00003064       A =   +.00001712
                          B =   +.00001352    BB =   +.00002419
   CC =  +.00001910       C =   +.00001067
                          D =   +.00000842    DD =   +.00001508
                          E =   +.00000665

K = +8.50    N = +23
                          P =   +.00003882
   AA =  -.00000645       A =   -.00003064
                          B =   +.00002419    BB =   +.00000569
   CC =  -.00000402       C =   -.00001910
                          D =   +.00001508    DD =   +.00000317
                          E =   -.00001190

K = +8.50    N = +24
                          P =   +.00000817
   AA =  +.00001154       A =   +.00000645
                          B =   +.00000509    BB =   +.00000911
   CC =  +.00000719       C =   +.00000402
                          D =   +.00000317    DD =   +.00000568
                          E =   +.00000250

K = +8.50    N = +25
                          P =   +.00001462
   AA =  -.00000243       A =   -.00001154
                          B =   +.00000911    BB =   +.00000191
   CC =  -.00000151       C =   -.00000719
                          D =   +.00000568    DD =   +.00000119
                          E =   -.00000448


K = +8.50    N = +26
                          P =   +.00000307
   AA =  +.00000434       A =   +.00000243
                          B =   +.00000191    BB =   +.00000343
   CC =  +.00000271       C =   +.00000151
                          D =   +.00000119    DD =   +.00000214
                          E =   +.00000094

K = +8.50    N = +27
                          P =   +.00000550
   AA =  -.00000091       A =   -.00000434
                          B =   +.00000343    BB =   +.00000072
   CC =  -.00000057       C =   -.00000271
                          D =   +.00000214    DD =   +.00000045
                          F =   -.00000168

K = +8.50    N = +28
                          P =   +.00000115
   AA =  +.00000163       A =   +.00000091
                          B =   +.00000072    BB =   +.00000129
   CC =  +.00000102       C =   +.00000057
                          D =   +.00000045    DD =   +.00000080
                          E =   +.00000035

K = +8.50    N = +29
                          P =   +.00000207
   AA =  -.00000034       A =   -.00000163
                          B =   +.00000129    BB =   +.00000027
   CC =  -.00000021       C =   -.00000102
                          D =   +.00000080    DD =   +.00000016
                          E =   -.00000063

K = +8.50    N = +30
                          P =   +.00000043
   AA =  +.00000061       A =   +.00000034
                          B =   +.00000027    BB =   +.00000048
   CC =  +.00000038       C =   +.00000021
                          D =   +.00000016    DD =   +.00000030
                          E =   +.00000013
```

AEDC-TR-65-69

```
K = +9.00    N = +1
                          P = +1.79999980
    AA = -.28799990       A = -1.63999980
                          B = +1.15199990    BB = +.23040000
    CC = -.18431998       C = -.92159990
                          D = +.73727992     DD = +.14745599
                          E = -.58982393

K = +9.00    N = +2
                          P = +.35999998
    AA = +.51839997       A = -.28799998
                          B = +.23039999     BB = +.41471998
    CC = +.33177998       C = -.18431999
                          D = +.14745599     DD = +.26542078
                          E = +.11796479

K = +9.00    N = +3
                          P = +.64799994
    AA = -.10367999       A = -.51839995
                          B = +.41471996     BB = +.08294399
    CC = -.06635519       C = -.33177597
                          D = +.26542078     DD = +.05308416
                          E = -.21233662

K = +9.00    N = -4
                          P = +.12959999
    AA = +.18662390       A = +.10367999
                          B = +.08294399     BB = +.14929918
    CC = +.11943935       C = -.06635519
                          D = +.05308415     DD = +.09555148
                          E = +.04246752

K = +9.00    N = +5
                          P = +.23327996
    AA = -.03732480       A = -.18662397
                          B = +.14929917     BB = +.02985983
    CC = -.02388787       C = -.11943934
                          D = +.09555147     DD = +.01911029
                          E = -.07644117

K = +9.00    N = +6
                          P = +.04665599
    AA = +.06718463       A = +.03732479
                          B = +.02985983     BB = +.05374770
    CC = +.04299816       C = +.02388786
                          D = +.01911029     DD = +.03439853
                          E = +.01528023

K = +9.00    N = +7
                          P = +.08398080
    AA = -.01543692       A = -.06718464
                          B = +.05374771     BB = +.010.954
    CC = -.00059963       C = -.04299817
                          D = +.03439853     DD = +.00687970
                          E = -.02751883

K = +9.00    N = +8
                          P = +.01679616
    AA = +.02418647       A = +.01343692
                          B = +.01074954     BB = +.01934917
    CC = +.01547934       C = +.00859963
                          D = +.00687970     DD = +.01238347
                          E = +.00550376

K = +9.00    N = +9
                          P = +.03023309
    AA = -.00483729       A = -.02418647
                          B = +.01934918     BB = +.00386983
    CC = -.00309587       C = -.01547934
                          D = +.01238347     DD = +.00247669
                          E = -.00990678

K = +9.00    N = +10
                          P = +.00604661
    AA = +.00870713       A = +.00483729
                          B = +.00386983     BB = +.00696570
    CC = +.00557256       C = +.00309586
                          D = +.00247669     DD = +.00445885
                          E = +.00198135

K = +9.00    N = +11
                          P = +.01088390
    AA = -.00174142       A = -.00870712
                          B = +.00696570     BB = +.00139314
    CC = -.00111451       C = -.00557256
                          D = +.00445804     DD = +.00089160
                          E = -.00356643

K = +9.00    N = +12
                          P = +.00217678
    AA = +.00313456       A = +.00174142
                          B = +.00139314     BB = +.00250765
    CC = +.00200612       C = +.00111451
                          D = +.00089160     DD = +.00160489
                          E = +.00071328

K = +9.00    N = +13
                          P = +.00391020
    AA = -.00062691       A = -.00313456
                          B = +.00250765     BB = +.00050153
    CC = -.00040122       C = -.00200612
                          D = -.00160489     DD = +.00032097
                          E = -.00128391

K = +9.00    N = +14
                          P = +.00078364
    AA = +.00112844       A = +.00062691
                          B = +.00050153     BB = +.00090275
    CC = +.00072220       C = +.00040122
                          D = +.00032097     DD = +.00057776
                          E = +.00025678

K = +9.00    N = +15
                          P = +.00141055
    AA = -.00022568       A = +.00112844
                          B = +.00090275     BB = +.00018055
    CC = -.00014444       C = -.00072220
                          D = +.00057776     DD = +.00011555
                          E = -.00046221
```

```
K = +9.00     N = -16
                        P =  +.00028211
AA =  +.00040623        A =  +.00022568
                        B =  +.00018055    BB =  +.00032499
CC =  +.00025999        C =  +.00014444
                        D =  +.00011555    DD =  +.00020799
                        E =  +.00009244


K = +9.00     N = +17
                        P =  +.00050779
AA =  -.00008124        A =  -.00040623
                        B =  +.00032499    BB =  +.00006499
CC =  -.00005199        C =  -.00025999
                        D =  +.00020799    DD =  +.00004159
                        E =  -.00016639


K = +9.00     N = +18
                        P =  +.00010155
AA =  +.00014624        A =  +.00008124
                        B =  +.00006499    BB =  +.00011699
CC =  +.00009359        C =  +.00005199
                        D =  +.00004159    DD =  +.00007487
                        E =  +.00003327


K = +9.00     N = +19
                        P =  +.00018280
AA =  -.00002924        A =  -.00014624
                        B =  +.00011699    BB =  +.00002339
CC =  -.00001871        C =  -.00009359
                        D =  +.00007487    DD =  +.00001497
                        E =  -.00005990


K = +9.00     N = +20
                        P =  +.00003656
AA =  +.00005264        A =  +.00002924
                        B =  +.00002339    BB =  +.00004211
CC =  +.00003369        C =  +.00001871
                        D =  +.00001497    DD =  +.00002695
                        E =  +.00001198


K = +9.00     N = +21
                        P =  +.00006581
AA =  -.00001052        A =  -.00005264
                        B =  +.00004211    BB =  +.00000842
CC =  -.00000673        C =  -.00003369
                        D =  +.00002695    DD =  +.00000539
                        E =  -.00002156


K = +9.00     N = +22
                        P =  +.00001316
AA =  +.00001895        A =  +.00001052
                        B =  +.00000842    BB =  +.00001516
CC =  +.00001213        C =  +.00000673
                        D =  +.00000539    DD =  +.00000970
                        E =  +.00000431


K = +9.00     N = +23
                        P =  +.00002369
AA =  -.00000379        A =  -.00001895
                        B =  +.00001516    BB =  +.00000303
CC =  -.00000242        C =  -.00001213
                        D =  +.00000970    DD =  +.00000194
                        E =  -.00000776


K = +9.00     N = +24
                        P =  +.00000473
AA =  +.00000682        A =  +.00000379
                        B =  +.00000303    BB =  +.00000545
CC =  +.00000436        C =  +.00000242
                        D =  +.00000194    DD =  +.00000349
                        E =  +.00000155


K = +9.00     N = +25
                        P =  +.00000852
AA =  -.00000136        A =  -.00000682
                        B =  +.00000545    BB =  +.00000109
CC =  -.00000087        C =  -.00000436
                        D =  +.00000349    DD =  +.00000069
                        E =  -.00000279


K = +9.00     N = +26
                        P =  +.00000170
AA =  +.00000245        A =  +.00000136
                        B =  +.00000109    BB =  +.00000196
CC =  +.00000157        C =  +.00000087
                        D =  +.00000069    DD =  +.00000125
                        E =  +.00000055


K = +9.00     N = +27
                        P =  +.00000307
AA =  -.00000049        A =  -.00000243
                        B =  +.00000196    BB =  +.00000039
CC =  -.00000031        C =  -.00000157
                        D =  +.00000125    DD =  +.00000025
                        E =  -.00000100


K = +9.00     N = +28
                        P =  +.00000061
AA =  +.00000088        A =  +.00000049
                        B =  +.00000039    BB =  +.00000070
CC =  +.00000056        C =  +.00000031
                        D =  +.00000025    DD =  +.00000045
                        E =  +.00000020


K = +9.00     N = +29
                        P =  +.00000110
AA =  -.00000017        A =  -.00000088
                        B =  +.00000070    BB =  +.00000014
CC =  -.00000011        C =  -.00000056
                        D =  +.00000045    DD =  +.00000009
                        E =  -.00000036


K = +9.00     N = +30
                        P =  +.00000022
AA =  +.00000031        A =  +.00000017
                        B =  +.00000014    BB =  +.00000025
CC =  +.00000020        C =  +.00000011
                        D =  +.00000009    DD =  +.00000016
                        E =  +.00000007
```

K = +9.50   N = +1

    AA = -.27901960
                    P = +1.80952390
                    A = -1.46485270
                    B = +1.18583310   BB = +.22587300
    CC = -.18284955
                    C = -.95996010
                    D = +.77711055   DD = +.14802106
                    E = -.62908949

K = +9.50   N = +2

    AA = +.50489257
                    P = +.34467125
                    A = +.27901958
                    B = +.22587299   BB = +.40872255
    CC = +.33087063
                    C = +.18284956
                    D = +.14802107   DD = +.26784765
                    E = +.11982658

K = +9.50   N = +3

    AA = -.09617003
                    P = +.62369093
                    A = -.50489265
                    B = +.40872262   BB = +.07785194
    CC = -.08302299
                    C = -.53087068
                    D = +.26784769   DD = +.05101861
                    E = -.21682908

K = +9.50   N = +4

    AA = +.17402195
                    P = +.11879827
                    A = +.09617002
                    B = +.07785192   BB = +.14087491
    CC = +.11404159
                    C = +.06302298
                    D = +.05101860   DD = +.09251938
                    E = +.04130077

K = +9.50   N = +5

    AA = -.03314704
                    P = +.21496872
                    A = -.17402197
                    B = +.14087493   BB = +.02683332
    CC = -.02172222
                    C = -.11404161
                    D = +.09251939   DD = +.01758464
                    E = -.07473474

K = +9.50   N = +6

    AA = +.05998036
                    P = +.04094435
                    A = +.03314704
                    B = +.02683332   BB = +.04855553
    CC = +.03930686
                    C = +.02172221
                    D = +.01758464   DD = +.03181983
                    E = +.01423519

K = +9.50   N = +7

    AA = -.01142483
                    P = +.07409340
                    A = -.05998037
                    B = +.04855553   BB = +.00924867
    CC = -.00748702
                    C = -.03950686
                    D = +.03181984   DD = +.00606092
                    E = -.02575891

K = +9.50   N = +8

    AA = +.07067950
                    P = +.01411303
                    A = +.01142483
                    B = +.00924867   BB = +.01673569
    CC = +.01354794
                    C = +.00748702
                    D = +.00606092   DD = +.01096738
                    E = +.00490646

K = -9.50   N = +9

    AA = -.00393781
                    P = +.02553786
                    A = -.02067351
                    B = +.01673569   BB = +.00318775
    CC = -.00258056
                    C = -.01354794
                    D = +.01096738   DD = +.00208902
                    E = -.00887855

K = +9.50   N = +10

    AA = +.00712596
                    P = +.00486435
                    A = +.00393781
                    B = +.00318775   BB = +.00576871
    CC = -.00466958
                    C = +.00258056
                    D = +.00208902   DD = +.00378014
                    E = +.00169111

K = +9.50   N = +11

    AA = -.00135725
                    P = +.00880217
                    A = -.00712556
                    B = +.00576831   BB = +.00109872
    CC = -.00088944
                    C = -.00466958
                    D = +.00378014   DD = +.00072002
                    E = -.00306011

K = +9.50   N = +12

    AA = +.00245597
                    P = +.00167660
                    A = +.00135725
                    B = +.00109872   BB = +.00198817
    CC = +.00160947
                    C = +C00088944
                    D = +.00072002   DD = +.00130290
                    E = +.00058287

K = +9.50   N = +13

    AA = -.00046780
                    P = +.00303385
                    A = -.00245597
                    B = +.00198817   BB = +.00037869
    CC = -.00030656
                    C = -C00160947
                    D = +.00130290   DD = +.00024817
                    E = -.00105473

K = +9.50   N = +14

    AA = +.00084650
                    P = +.00057387
                    A = +.00046780
                    B = +.00037869   BB = +.00068526
    CC = +.00055473
                    C = +.00030656
                    D = +.00024817   DD = +.00044907
                    E = +.00020090

K = +9.50   N = +15

    AA = -.00014125
                    P = +.00104568
                    A = -.00084650
                    B = +.00068526   BB = +.00013052
    CC = -.00010566
                    C = -.00055473
                    D = +.00044907   DD = +.00008553
                    E = -.00036353

```
K = +9.50    N = +16

                            P =  +.00019917
     AA =  +.00029176       A =  +.00016123
                            B =  +.00013052    BB =  +.00023619
     CC =  +.00019120       C =  +.00010566
                            D =  +.00008553    DO =  +.00015478
                            E =  +.00006924


K = +9.50    N = +17

                            P =  +.00056041
     AA =  -.00005557       A =  -.00029176
                            B =  +.00023619    BB =  +.00004498
     CC =  -.00003641       C =  -.00019120
                            D =  +.00015478    DD =  +.00002948
                            E =  -C00012530


K = +9.50    N = +18

                            P =  +.00006865
     AA =  +.00010056       A =  +.00005557
                            B =  +.00004498    BB =  +.00008140
     CC =  +.00006590       C =  +.00003641
                            D =  +.00002948    OO =  +.00005534
                            E =  +C00002386


K = +9.50    N = +19

                            P =  +.00012422
     AA =  -.00001915       A =  -.0001005(
                            B =  +.00008140    BB =  +.00001550
     CC =  -.00001255       C =  -.00006590
                            D =  +.00005534    OO =  +.00001016
                            E =  -.00004318


K = +9.50    N = +20

                            P =  +.00002366
     AA =  +.00003466       A =  +.00001915
                            B =  +.00001550    BB =  +.00002805
     CC =  +.00002271       C =  +.00001255
                            D =  +.00001016    DD =  +.00001838
                            E =  +.00000822
```

```
K = +9.50    N = +21

                            P =  +C00004281
     AA =  -.00000660       A =  -.00003466
                            B =  +.00002805    BB =  +.00000534
     CC =  -.00000432       C =  -.00002271
                            D =  +.00001838    OO =  +.00000350
                            E =  -.00001488


K = +9.50    N = +22

                            P =  +.00000815
     AA =  +.00001194       A =  +.00000660
                            B =  +.00000534    BB =  +.00000967
     CC =  +.00000782       C =  +.00000432
                            D =  +.00000350    OO =  +.00000633
                            E =  +.00000283


K = +9.50    N = +23

                            P =  +.00001475
     AA =  -.00000227       A =  +.00001194
                            B =  +.00000967    BB =  +.00000184
     CC =  -.00000149       C =  -.00000782
                            D =  +.00000633    OO =  +.00000120
                            E =  -.00000513


K = +9.50    N = +24

                            P =  +.00000281
     AA =  +.00000411       A =  +.00000227
                            B =  +.00000184    BB =  +.00000333
     CC =  +.00000269       C =  +.00000149
                            D =  +.00000120    DD =  +.00000218
                            E =  +.00000097


K = +9.50    N = +25

                            P =  +.0000050
     AA =  -.00000078       A =  -.00000411
                            B =  +.00000333    BB =  +.00000063
     CC =  -.00000051       C =  -.00000269
                            D =  +.00000218    OO =  +.00000041
                            E =  -.00000176
```

```
K = +9.50    N = +26

                            P =  +.00000096
     AA =  +.00000141       A =  +.00000078
                            B =  +.00000063    BB =  +.00000114
     CC =  +.00000093       C =  +.00000051
                            D =  +.00000041    OO =  +.00000075
                            E =  +.00000033


K = +9.50    N = +27

                            P =  +.00000175
     AA =  -.00000027       A =  -.00000141
                            B =  +.00000114    BB =  +.00000021
     CC =  -.00000017       C =  -.00000093
                            D =  +.00000075    OO =  +.00000014
                            E =  -.00000060


K = +9.50    N = +28

                            P =  +.00000033
     AA =  +.00000048       A =  +.00000027
                            B =  +.00000021    BB =  +.00000039
     CC =  +.00000032       C =  +.00000017
                            D =  +.00000014    OO =  +.00000025
                            E =  +.00000011


K = +9.50    N = +29

                            P =  +.00000060
     AA =  -.00000009       A =  -.00000048
                            B =  +.00000039    BB =  +.00000007
     CC =  -.00000006       C =  -.00000032
                            O =  +.00000025    DD =  +.00000004
                            E =  -.00000021


K = +9.50    N = +30

                            P =  +.00000011
     AA =  +.00000016       A =  +.00000009
                            B =  +.00000007    BB =  +.00000013
     CC =  +.00000011       C =  +.00000006
                            O =  +.00000004    DO =  +.00000008
                            E =  +.00000004
```

```
K = +10.00    N = +1                                    K = +10.00    N = +6                                    K = +10.00    N = +11

                      P =  +1.81818160                                       P =  +.03612630                                        P =  +.00717811
   AA = -.27047330    A =  -1.48760310                     AA = +.05374161   A =  +.02955788                       AA = -.00106781    A =  -.00587300
                      B =  +1.21712980   BB = -.22129640                      B =  +.02418372   BB = +.04597040                      B =  +.00480518   BB = +.00087366
   CC = -.18106063    C =  -.99583346                       CC = +.03597578  C =  +.01978668                       CC = -.00071482   C =  -.00393151
                      D =  +.81477283   DD = +.14814053                       D =  +.01618910   DD = +.02943473                      D =  +.00321669   DD = +.00058485
                      E =  -.66643230                                         E =  +.01324563                                        E =  -.00263183


K = +10.00    N = +2                                    K = +10.00    N = +7                                    K = +10.00    N = +12

                      P =  +.33097847                                        P =  +.06568419                                        P =  +.00130511
   AA = +.49176962    A =  +.27047329                      AA = -.00977120   A =  -.05374161                       AA = +.00194148    A =  +.00106781
                      B =  +.22129633   BB = +.40235696                       B =  +.04397040   BB = +.00799462                      B =  +.00087366   BB = +.00158848
   CC = +.32920114    C =  +.18106063                       CC = -.00654105  C =  -.03597578                       CC = +.00129967   C =  +.00071482
                      D =  +.14814051   DD = +.26934638                       D =  +.02943473   DD = +.00535177                      D =  +.00058485   DD = +.00106336
                      E =  +.12120587                                         E =  -.02408296                                        E =  +.00047851


K = +10.00    N = +3                                    K = +10.00    N = +8                                    K = +10.00    N = +13

                      P =  +.60105172                                        P =  +.0119A258                                        P =  +.00237292
   AA = -.08941265    A =  -.49176958                      AA = +.01776582   A =  +.00977120                       AA = -.00035299    A =  -.00194148
                      B =  +.40235693   BB = +.07315581                       B =  +.00799461   BB = +.01453567                      B =  +.00158849   BB = +.00028881
   CC = -.05985475    C =  -.32920112                       CC = +.01189282  C =  +.00654105                       CC = -.00023630   C =  -.00129967
                      D =  +.26934637   DD = +.04897207                       D =  +.00535177   DD = +.00973049                      D =  +.00106336   DD = +.00019333
                      E =  -.22037430                                         E =  +.00437872                                        E =  -.00087002


K = +10.00    N = +4                                    K = +10.00    N = +9                                    K = +10.00    N = +14

                      P =  +.10920213                                        P =  +.02171378                                        P =  +.00043144
   AA = +.16256545    A =  +.08941265                      AA = -.00325015   A =  -.01776582                       AA = +.00064181    A =  +.00035299
                      B =  +.07315580   BB = +.13301055                       B =  +.01453567   BB = +.00264285                      B =  +.00028881   BB = +.00052512
   CC = +.10882681    C =  +.05985474                       CC = -.00216233  C =  -.01189282                       CC = +.00042964   C =  +.00023630
                      D =  +.04897206   DD = +.08904012                       D =  +.00973049   DD = +.00176918                      D =  +.00019333   DD = -.00035152
                      E =  +.04006805                                         E =  -.00796131                                        E =  +.0001581


K = +10.00    N = +5                                    K = +10.00    N = +10                                   K = +10.00    N = +15

                      P =  +.19869476                                        P =  +.0039A796                                        P =  +.00078443
   AA = -.02955790    A =  -.16256844                      AA = +.00587300   A =  +.00323015                       AA = -.00011669    A =  -.00064181
                      B =  +.13301054   BB = +.02418374                       B =  +.00264285   BB = +.00480510                      B =  +.00052512   BB = +.00009547
   CC = -.01978669    C =  -.10882680                       CC = +.00393151  C =  +.00216233                       CC = -.00007811   C =  -.00042964
                      D =  +.08904011   DD = +.01618911                       D =  +.00176918   DD = +.00321669                      D =  +.00035152   DD = +.00006391
                      E =  -.07285099                                         E =  +.00144751                                        E =  -.00028761
```

```
K = +10.00    N = +16
                        P =  +.00014262
    AA =  -.00021216    A =  +.00011669
                        0 =  +.00009547    BB =  +.00017359
    CC =  +.00014203    C =  -.00007811
                        D =  +.00006391    DD =  +.00011620
                        E =  +.00005229

K = +10.00    N = +17
                        P =  +.00025931
    AA =  -.00003857    A =  -.00021216
                        B =  +.00017359    BB =  +.00003156
    CC =  -.00002582    C =  -.00014203
                        D =  +.00011620    DD =  +.00002112
                        E =  -.00009507

K = +10.00    N = +18
                        P =  +.00004714
    AA =  +.00007013    A =  +.00003857
                        B =  +.00003156    BB =  +.00005738
    CC =  +.00004695    C =  +.00002582
                        0 =  +.00002112    DD =  +.00003841
                        E =  +.00001728

K = +10.00    N = +19
                        P =  +.00008572
    AA =  -.00001275    A =  -.00007013
                        B =  +.00005738    BB =  +.00001043
    CC =  -.00000863    C =  -.00004695
                        0 =  +.00003841    DD =  +.00000698
                        E =  -.00003143

K = +10.00    N = +20
                        P =  +.00001558
    AA =  +.00002318    A =  +.00001275
                        0 =  +.00001043    BB =  +.00001897
    CC =  +.00001552    C =  +.00000853
                        0 =  +.00000698    DD =  +.00001269
                        E =  +.00000571


K = +10.00    N = +21
                        P =  +.00002833
    AA =  -.00000421    A =  -.00002318
                        B =  +.00001897    BB =  +.00000344
    CC =  -.00000282    C =  -.00001552
                        D =  +.00001269    DD =  +.00000230
                        E =  -.00001039

= +10.00    N = +22
                        P =  +.00000515
    AA =  +.00000766    A =  +.00000421
                        B =  +.00000344    BB =  +.00000627
    CC =  +.00000513    C =  +.00000282
                        D =  +.00000230    DD =  +.00000419
                        E =  +.00000188

K = +10.00    N = +23
                        P =  +.00000936
    AA =  -.00000139    A =  -.00000766
                        B =  +.00000627    BB =  +.00000114
    CC =  -.00000093    C =  -.00000513
                        D =  +.00000419    00 =  +.00000076
                        E =  -.00000343

K = +10.00    N = +24
                        P =  +.00000170
    AA =  -.00000253    A =  +.00000139
                        B =  +.00000114    BB =  +.00000207
    CC =  +.00000169    C =  +.00000093
                        D =  +.00000076    DD =  +.00000138
                        E =  +.00000062

K = +10.00    N = +25
                        P =  +.00000309
    AA =  -.00000046    A =  -.00000253
                        B =  +.00000207    BB =  +.00000037
    CC =  -.00000030    C =  -.00000169
                        D =  +.00000138    DD =  +.00000025
                        E =  -.00000113


K = +10.00    N = +26
                        P =  +.00000056
    AA =  +.00000083    A =  +.00000046
                        0 =  +.00000037    BB =  +.00000068
    CC =  +.00000056    C =  +.00000030
                        D =  +.00000025    DD =  +.00000045
                        E =  +.00000020

K = +10.00    N = +27
                        P =  +.00000102
    AA =  -.00000015    A =  -.00000083
                        B =  +.00000068    BB =  +.00000015
    CC =  -.00000010    C =  -.00000056
                        0 =  +.00000045    DD =  +.00000008
                        E =  -.00000037

K = +10.00    N = +28
                        P =  +.0000001
    AA =  +.00000027    A =  +.00000015
                        N =  +.00000012    BB =  +.00000022
    CC =  +.00000018    C =  +.00000010
                        D =  +.00000008    DD =  +.00000015
                        F =  +.00000006

K = +10.00    N = +29
                        P =  +.00000033
    AA =  -.00000005    A =  -.00000027
                        B =  +.00000022    BB =  +.00000004
    CC =  -.00000003    C =  -.00000018
                        D =  +.00000015    DD =  +.00000002
                        E =  -.00000012

K = +10.00    N = +30
                        P =  +.00000006
    AA =  +.00000009    A =  +.00000005
                        R =  +.00000004    BB =  +.00000007
    CC =  +.00000006    C =  +.00000003
                        D =  +.00000002    00 =  +.00000005
                        E =  +.00000002
```

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)	2a. REPORT SECURITY CLASSIFICATION
Arnold Engineering Development Center ARO, Inc. Arnold Air Force Station, Tennessee	UNCLASSIFIED
	2b. GROUP N/A

3. REPORT TITLE

STRESS WAVES IN COMPOSITE LAMINATES

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)
N/A

This document has been approved for public release ~~DDC TR 75/5~~
its distribution is unlimited. ~~Rey DDC 11/500 AD A011500 DFd July 1975~~

5. AUTHOR(S) (Last name, first name, initial)

Kinslow, Ray ARO, Inc.

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
June 1965	114	9

8a. CONTRACT OR GRANT NO. AF 40(600)-1000	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO. 8871	AEDC-TR-65-69
c. Program Element 62405364	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d. Task 887101	N/A

10. AVAILABILITY/LIMITATION NOTICES

Qualified requesters may obtain copies of this report from DDC.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY Arnold Engineering Development Center Air Force Systems Command Arnold Air Force Station, Tennessee
N/A	

13. ABSTRACT

Fractures caused by stress waves resulting from hypervelocity impact are sometimes reduced, and at other times are increased, by the use of laminated materials. An analysis of some of the parameters which affect the ability of a laminated structure to resist fracture following impact has been conducted. It is shown that there are multiple reflections from the interfaces bounding any layer of material. The amplitudes of these waves attenuate very rapidly, but because their transmitted components may combine in phase with other waves, they sometimes contribute substantially to the total stress produced. It is shown that these combined waves may result in a stress much greater in the laminated material than would have been produced by the same impact on a solid target of either of the materials used; however, under other conditions, the laminate may be employed to reduce the stress to a very small value. Pressure pulse amplitudes in materials having impedance mismatch values ranging from 0.1 to 10.0 and having as many as thirty laminations are presented in both graphical and tabular form.

DD FORM 1473
1 JAN 64

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
stress waves						
laminates						
impact						

INSTRUCTIONS

1. ORIGINATING ACTIVITY: Enter the name and address of the contractor, subcontractor, grantee, Department of Defense activity or other organization (corporate author) issuing the report.

2a. REPORT SECURITY CLASSIFICATION: Enter the overall security classification of the report. Indicate whether "Restricted Data" is included. Marking is to be in accordance with appropriate security regulations.

2b. GROUP: Automatic downgrading is specified in DoD Directive 5200.10 and Armed Forces Industrial Manual. Enter the group number. Also, when applicable, show that optional markings have been used for Group 3 and Group 4 as authorized.

3. REPORT TITLE: Enter the complete report title in all capital letters. Titles in all cases should be unclassified. If a meaningful title cannot be selected without classification, show title classification in all capitals in parenthesis immediately following the title.

4. DESCRIPTIVE NOTES: If appropriate, enter the type of report, e.g., interim, progress, summary, annual, or final. Give the inclusive dates when a specific reporting period is covered.

5. AUTHOR(S): Enter the name(s) of author(s) as shown on or in the report. Enter last name, first name, middle initial. If military, show rank and branch of service. The name of the principal author is an absolute minimum requirement.

6. REPORT DATE: Enter the date of the report as day, month, year; or month, year. If more than one date appears on the report, use date of publication.

7a. TOTAL NUMBER OF PAGES: The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.

7b. NUMBER OF REFERENCES: Enter the total number of references cited in the report.

8a. CONTRACT OR GRANT NUMBER: If appropriate, enter the applicable number of the contract or grant under which the report was written.

8b, 8c, & 8d. PROJECT NUMBER: Enter the appropriate military department identification, such as project number, subproject number, system numbers, task number, etc.

9a. ORIGINATOR'S REPORT NUMBER(S): Enter the official report number by which the document will be identified and controlled by the originating activity. This number must be unique to this report.

9b. OTHER REPORT NUMBER(S): If the report has been assigned any other report numbers (either by the originator or by the sponsor), also enter this number(s).

10. AVAILABILITY/LIMITATION NOTICES: Enter any limitations on further dissemination of the report, other than those

imposed by security classification, using standard statements such as:

(1) "Qualified requesters may obtain copies of this report from DDC."

(2) "Foreign announcement and dissemination of this report by DDC is not authorized."

(3) "U. S. Government agencies may obtain copies of this report directly from DDC. Other qualified DDC users shall request through

_____."

(4) "U. S. military agencies may obtain copies of this report directly from DDC. Other qualified users shall request through

_____."

(5) "All distribution of this report is controlled. Qualified DDC users shall request through

_____."

If the report has been furnished to the Office of Technical Services, Department of Commerce, for sale to the public, indicate this fact and enter the price, if known.

11. SUPPLEMENTARY NOTES: Use for additional explanatory notes.

12. SPONSORING MILITARY ACTIVITY: Enter the name of the departmental project office or laboratory sponsoring (paying for) the research and development. Include address.

13. ABSTRACT: Enter an abstract giving a brief and factual summary of the document indicative of the report, even though it may also appear elsewhere in the body of the technical report. If additional space is required, a continuation sheet shall be attached.

It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as (TS), (S), (C), or (U).

There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.

14. KEY WORDS: Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, rules, and weights is optional.